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RECORDS OF THE BRITISH ZYGAENIDAE

I have in preparation a paper on the distribution of the species of *Zygaena* and *Procris* found in the British Isles, with maps showing the geographical range of each species in these islands. I would welcome authentic records, especially from Ireland, Scotland, Wales and South-West England. Records of *trifolii* (both the early May-June subspecies and the July-August subspecies) and *lonicerae* would be of special interest, including any from southern England, as here the range of the two species overlaps. As these two species, *trifolii* and *lonicerae*, are sometimes difficult to separate, I shall be pleased to determine any doubtful specimens, which should be sent to me by 31st December, 1960.

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W. G. Tremewan

CHECK-LISTS AND SYSTEMATICS—A CRITICISM

All enquiring lepidopterists will welcome the editorial views* expressed in the April number (*Ent. Gaz.* **11**: 2, 1960) and will wish to comment on Mr. Heslop's systematics.

Two very different issues are raised when check-lists of this nature are published, firstly the nomenclature and secondly the systematic arrangement. So far as nomenclature is concerned, few if any field workers and collectors are conversant with or even interested in the complexities and research necessary to agree established species names, and to change names that have long been in use. The field man generally is aware of it only at such times as new names are presented to him, and he has to re-sort his insects and their names within the already swollen and muddy waters of synonymy. Such progress is embarrassing, but can be justified, and workers have through the years come to bear with it and to recognize that changes will continue.

But name changing, however inconvenient or confusing, is the lesser of the two problems. The major function of any organized list should be the endeavour on the part of the author to present his Families and Genera arranged systematically on the lines of some logical and arguable pattern, no matter whether his views are shared or popular. The arrangement may not be intended to be a 'natural' one, in that it may be the result of classification based on one set of values alone, or it may attempt to combine at different levels the fruits of other systems, employing what the author thinks to be the most fundamental and reasonable values which in sum reflect the evolution and speciation which the Lepidoptera have undergone.

Such a systematic list is the virtual reason for the pure study of Lepidoptera, as distinct from its applied study in such fields as insect physiology or genetics, where it becomes the vehicle and not the end-product, and the importance of this list cannot be over-stressed. Yet merely to assemble species—even with the latest revised names—into a list is not good enough. If the arrangement is novel or contains any original work on the part of the author, then discussion and elaboration of his views and criteria are essential. If the arrangement contains no new work, then it is still necessary to state exactly whose system is being followed.

With the publication of this third edition of Mr. Heslop's check-list the British collector is still given no reason why the arrangement is so very different from that of Seitz, Pierce or Meyrick; or which of the basic principles as summarized by Tutt (1899), Meyrick (1922), Imms (1934) and Ford (1955) have been followed; or even why the present treatment of Mr. Heslop's own 'Noctuoidea' bears so little relation to the 'Agrotides' of the last edition. It would be interesting to learn on what basis Mr. Heslop arrives at his present arrangement,

* Readers were invited to express their own views on the systematic arrangement of the British Lepidoptera.—Ed.

for it is high time there existed a check-list of the British Lepidoptera consistent with modern taxonomy.

Mr. Heslop has spoken (p. 177) of the 'progressive deterioration of the genus as an instrument of classification'. The remedy is entirely in his own hands; it is not to similarly destroy and debase the sub-family unit.

G. HAGGETT.

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THE HESLOP CHECK-LIST OF LEPIDOPTERA

Dear Sir,—In your April Editorial you comment on two aspects of the new list and ask for your readers' views. On the first aspect, that of pure nomenclature, generic and specific, I do not dare to comment, for surely that is primarily such a skilled and scientific matter that it must be left in the able hands of the British Museum specialists, or at least, criticism can only be valid from people of equal authority. But the second aspect, the *arrangement* of the classification in broad outline is the acute concern of all Lepidopterists, amateur as well as professional, field workers as well as research workers, and I want to plead for especial care on behalf of the rising generation as well as those unborn! If serious errors arise in a published list with regard to the basic principles of affinity underlying all classification, young enthusiasts will certainly be perverted, confusion caused, and rectification made most difficult. I will only cite one example of Mr. Heslop's family arrangement which completely passes my comprehension; he has to all appearances reverted to the old Doubleday list of nearly a hundred years ago so far as the Butterflies are concerned. My scientific faith is based on such established principles as the higher degree of specialization of a butterfly having four walking legs to one having six. Surely the Royal Entomological Society (1934 list), Dr. E. B. Ford (*Butterflies*, 1945) and many others cannot *all* be wrong! I appeal to Mr. Heslop to have second thoughts before it is too late.

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PRUINESCENCE IN *ISCHNURA ELEGANS* VAN der LINDEN (ODONATA, COENAGRIIDAE)

Pruinescence, derived from the Latin 'pruina' meaning 'hoar-frost', is a term used to designate the 'bloom' that appears on certain fruit and fungi. It it used in a special sense by odonatologists to describe the powdery exudate which appears on the body of some species of dragonfly.

This exudate, usually white or powder-blue, develops gradually on the surface of the body, and is produced in the hypodermal cells. It does appear occasionally in very aged females, but it is seen at its best in the mature male, for example in *Libellula depressa* L., where the whole of the dorsal surface of the abdomen is covered with it. There are many beautiful manifestations of colour in dragonflies, but to me the exquisite powder-blue of this and similar species, which is seen at its best when the insect is resting by the side of a pond in the sunshine of a late summer day, is a sight which seems unforgettable, though the reality always transcends recollection.

In the middle of August, 1959, on a pond in Windsor Great Park, I was watching a colony of *Erythromma najas* Hansemann, a species which I have no chance of seeing near my home in Brecon. These damsel flies show some degree of pruinescence, and as I was admiring them I saw another and different damsel fly which I did not at first recognize, also showing pruinescence. It proved to be an adult male *Ischnura elegans,* with the head, thorax and tail of an intense dark blue colour quite unlike the usual form. The pruinescene was of a similar degree to that exhibited by *Erythromma najas,* and in fact this is what drew my attention to it. The specimen was later seen by Miss Longfield, who attributes the colour to the combined effects of maturity, longevity and the heat of the summer of 1959. While she herself had never seen such a colour form of *Ischnura elegans,* it appears that pruinescence is commonly found in many mature Coenagriidae in the tropics. If confirmation were needed of the exceptional quality of last summer, this specimen of *Ischnura elegans* surely provided it.

DAVID KYLE, M.A., M.B., B.Ch.

A RECORD OF *LEUCANIA ALBIPUNCTA* SCHIFF. (LEP., NOCTUIDAE) IN THE LONDON AREA

A male specimen of *Leucania albipuncta* Schiff. came to light in my garden on the night of 25th-26th June, 1960. Baron de Worms, in his list of London moths, gives very few records of this species.

R. I. LORIMER.

8 Southway,
Totteridge, N.20.

A SPECIES OF COLLEMBOLA NEW TO THE BRITISH ISLES

By H. E. GOTO AND P. N. LAWRENCE

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Among specimens of Collembola preserved in the Entomology Department of the British Museum (Natural History) are a number belonging to the species *Xenylla welchi* Folsom, 1916. This species, although already reported from Continental Europe, has never been recorded from the British Isles. The British specimens agree with material from New York identified by Folsom and preserved in the British Museum.

The data available with the specimens are as follows:

Kent: Selling, January, 1957, mushroom compost, W. St. G. Light.

Sussex: Lancing, 1952, mushroom compost, W. St. G. Light.

Surrey: Laleham, 1951, mushroom, E. R. Speyer.

Norfolk: Gt. Yarmouth, June, 1944, cucumber house.

The number of species of this genus recorded from the British Isles is now eight. *X. welchi* may be separated from the other species by the following characters:

Eyes, 5 + 5; tibiotarsal clavate setae; I (1), II (2), III (2); unguis without lateral teeth, usually with one inner tooth; dens with two setae; mucro completely separated from the dens and about three-quarters of its length; apex of mucro rounded and upturned but not laterally broadened; mucro without ventral tooth but with distinct, untoothed lamella extending from the base of the mucro along about three-quarters of its length; small anal spines present; colour, grey to dark blue; length up to ·9 mm.

THE GENUS *EPHESTIA* GUENĒE (LEP., PHYCITINAE)

By PAUL E. S. WHALLEY

British Museum (Natural History)

For many years this genus has contained a heterogeneous collection of species. Heinrich (1956) gave a detailed account of the genus and separated *E. kühniella* Zell. from the other species. He proposed a new genus, *Anagasta*, for this species, which is now in general use.

He also pointed out (1956, p. 302) that the remaining species of *Ephestia* were still a 'heterogeneous group', and separated the type species *E. elutella* Walk. from the others on both venation and genitalia characters.

Key (from Heinrich, 1956):

1. Hindwing with vein 3 and 5 stalked; costa of harpe (valva) smooth ..... *E. elutella* Walk.
2. Hindwing with veins 2 and 5 approximate at base; harpe with digitate projection middle or near middle of costa ....*E. cautella* Walk. and *E. figulilella* Gregs.

Although separating the two groups he did not propose a new generic name, but he did state that further work would show that the groups were 'generically distinguished' (1956, p. 302).

In 1958 Gozmany, writing notes on Hungarian Phycitinae, proposed the name *Xenephestia* for the *cautella* group. Although at the present time *Xenephestia* is the valid generic name, it has not come into general use. In some respects this is fortunate because there was already a generic name in existence for this group! In 1864 Walker described *Cadra defectella,* which was subsequently shown to be a synonym of *E. cautella* Walk. (The full details of the synonymy are given by Heinrich, 1956).

I have examined all the British species at present known as *Ephestia* Guen. (see Beirne, 1952). They should be placed as follows:

Ephestia elutella Hübn.
Anagasta kühniella Zell.
Cadra cautella Walk., **comb. nov.**
Cadra calidella Guen., **comb. nov.**
Cadra figulilella Gregs., **comb. nov.**
Cadra woodiella R. and Thom., **comb. nov.**

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ITAMA BRUNNEATA THUNB. (LEP., GEOMETRIDAE IN BUCKINGHAMSHIRE

On 27th June, 1960, I took a male specimen of *Itama brunneata* Thunb. in my mercury vapour trap at Chalfont St. Peter, Bucks. Although this little moth is stated by South (and by Newman) to be found only in Perthshire and northwards, it has occasionally been taken in the south, and I understand that at least three other specimens have occurred there this year—evidently emanating from a foreign migration. My specimen is distinctly larger and of a lighter brown shade than the normal Scottish specimens, and I believe this is also true of the others taken this year.

SIR ERIC ANSORGE.

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ADDITIONAL NOTES ON THE BRITISH SPECIES OF THE GENUS *ZYGAENA* FABRICIUS (LEP., ZYGAENIDAE)

By W. G. TREMEWAN
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The following notes include some amendments which have become necessary since the publication of my paper on the British *Zygaena* species in 1958. Many of the names which I then placed in synonymy are now removed as they have in fact proved to belong to distinct Continental races. I have had the opportunity of comparing further material, and it is obvious that the British races of *Z. filipendulae* Linné, *Z. trifolii* Esper and *Z. lonicerae* Scheven, which were formerly referred to the nominate race, should now be considered distinct subspecies. In August, 1959, the German *Zygaena* specialist Mr. Hugo Reiss visited England, and I was able to discuss with him the amendments and corrections set out below.

Zygaena purpuralis Brünnich

Sphinx purpuralis Brünnich, 1763, *Pontoppidan's Danske Atlas*, **1**: 686, pl. 30.

Before dealing with the known British races, I would like to refer to the old Cornish records. It was first recorded from Cornwall in 1881, when Gain (1881) wrote that he had taken specimens of *A. minos* at Tintagel in 1865. Birchall (1881) doubted the authenticity of the specimens, but on examining them wrote: 'They are certainly not the Irish form, viz. nubigena; it is possible that they are examples of the typical European Minos.' It is quite possible that *purpuralis* existed and still occurs in Cornwall, as there are many suitable localities along the north coast of that county where the food-plant grows. I do not think that the Gain specimens could have been worn *filipendulae*, as Birchall, who knew the Irish *purpuralis* well, would have recognized this.

There is a specimen of *purpuralis* in the British Museum labelled 'Bude, 1910 . . .'. Unfortunately the collector's name is undecipherable. I can find no published record of the species having been taken in Cornwall other than the one mentioned above. One would think that, if the species occurred there, it would have been discovered by the many collectors who visit the area for *Maculinea arion* Linné, but it must be remembered that *Zygaena* species are sometimes very local and confined to small areas.

Perhaps the above account will induce collectors who visit North Cornwall to look for *purpuralis*; their efforts might well be rewarding. If *purpuralis* does occur in Cornwall, it is highly probable that, being isolated from the North Wales colony, the race there would represent a new subspecies.

I previously recorded five specimens from the Isle of Man (Tremewan, 1958). These specimens, which are from the Tutt collection, were taken in 1882, but Tutt does not mention them in his records (Tutt, 1899). I believe that many of the Tutt specimens acquired by Rothschild were relabelled, and in this instance incorrectly. The Isle of Man has been fairly well worked and there are no records of the species having ever occurred there; neither are there any further specimens labelled 'Isle of Man'. Possibly the labelling on the Tutt specimens is a misinterpretation for the Isle of Mull, or more probably the Isles of Aran in Galway Bay. As I mentioned previously, the specimens strongly resemble the Irish *hibernica*; probably they originated from Ireland or the Aran Isles.

ssp. **hibernica** Reiss

Zygaena purpuralis var. *hibernica* Reiss, 1933, *Seitz, Suppl.*, **2**: 249.

Zygaena achilleae Esper, Newman *nec* Esper, 1861, *Zoologist*, **19**: 7565.

Described from specimens from Ardrahan, Galway and the Clare coast.

ssp. **hibernica** Reiss f. loc. **sabulosa** f. loc. nov.

Zygaena nubigena Lederer, Newman *nec* Lederer, 1861, *Zoologist*, **19**: 7677.

Zygaena nubigena Lederer, Birchall *nec* Lederer, 1866, *Ent. mon. Mag.*, **3**: 33 (*partim*).

This form, which was distinguished from *hibernica* by Newman in 1861, is now described as new.

♂ 25-30 mm. Head, thorax and abdomen dull black, strongly haired. Antennae black, ending in short thick clubs. Forewings greenish-black, streaks scarlet, with the axe-shaped mark long and extending near to the termen. Hindwings scarlet, paler than the forewing streaks, with a narrow black border widening at the apex. Cilia of fore- and hindwings bluish-black.

♀ 26-29 mm. Coloration similar to that in the male, but the scarlet is somewhat paler. Border of hindwings reduced or absent, when present light greenish-black. Cilia of fore- and hindwings light brownish-black.

Holotype: ♂ 'Ballyvaughan, Co. Clare, Ireland, vi.1913'.

Allotype: ♀ with the same data.

Paratypes: 13 ♂♂ and 10 ♀♀ with the same data as the holotype; 3 ♂♂ and 1 ♀ labelled 'Langham, Co. Clare, 6/14'; 1 ♀ 'Co. Clare, June, 1914', in H. C. Huggins' collection. These latter specimens were taken at Ballyvaughan by Sir Charles Langham. The holotype, allotype, and 23 paratypes are in the British Museum collection; 5 paratypes in H. C. Huggins' collection.

Compared with the typical *hibernica,* this form differs in the thinner scaling; the forewings are shorter and more rounded at the apex; the scarlet coloration of the forewing streaks and the hindwings

is dull and not so bright and vivid as that in *hibernica*. The thorax and abdomen are covered with dense dull black hair; in *hibernica* the thorax and abdomen are covered with short, shining bluish- or greenish-black hairs.

Ballyvaughan is situated between Ardrahan and Black Head (Clare coast), and it is strange that the population of *sabulosa* should differ so strongly from *hibernica*. The reason for the difference is probably environmental, as the specimens were taken on the sandhills at Ballyvaughan.

ssp. **caledonensis** Reiss

Zygaena purpuralis var. *caledonensis* Reiss, 1931, *Int. ent. Z.*, **25**: 341.

Zygaena nubigena Lederer, Birchall *nec* Lederer, 1866, *Ent. mon. Mag.*, **3**: 33 (*partim*).

This subspecies is from the west coast of Scotland and the Hebrides.

The species *purpuralis* is also found in Eastern Scotland, but little is known of its distribution there. It has been recorded from Stonehaven, and we have a single specimen from Arbroath. Material from these localities is required for comparison with *caledonensis* from Argyllshire.

ssp. **segontii** Tremewan

Zygaena purpuralis ssp. *segontii* Tremewan, 1958, *Ent. Gaz.*, **9** (4): 188.

A search for the Welsh subspecies was made in early June, 1959, but without success, probably due to the limited time the author had there. The weather was also extremely bad, with a south-west gale and a deluge of rain. It is hoped that a further visit will be made in 1961.

Zygaena exulans Reiner & Hohenwarth

Sphinx exulans Reiner & Hohenwarth, 1792, *Botan. Reisen.*, p. 265, pl. 6, Fig. 2.

The nominate race is from the Gross Glockner.

ssp. **subochracea** White

Zygaena exulans var. *subochracea* White, 1872, *Scot. Nat.*, **1**: 174.

This subspecies from Scotland is undoubtedly distinct from ssp. *vanadis* Dalman, with which it was previously confused. The latter subspecies is from Scandinavia.

Zygaena loti Schiffermüller & Denis

Sphinx loti Schiffermüller & Denis, 1775 *Wien. Verz.*, p. 45.

Sphinx lonicerae Scheven, Fuessly *nec* Scheven, 1778, *Mag. Ent.*, **1**: 140, pl. 1, Fig. 4.

Sphinx amsteinii Scheven, 1782, in Fuessly's *Neues Mag. Ent.*, **1**: 54.

Sphinx viciae Schiffermüller, Hübner *nec* Schiffermüller, 1796, *Europ. Schmett.*, **1**: pl. 2, Fig. 11 (corrected to *loti* in text, p. 79, 1805).

In my last paper (Tremewan, 1958) I considered *fulvia* Fabr. and *achilleae* Esp. as synonyms of *loti* S. & D. This is not quite correct, as these names represent Continental races of *loti*. I also placed *fulvia Fabr. as* **'syn. nov.'**, but Dujardin had already shown *fulvia* Fabr. to be conspecific with *loti* S. & D. (Dujardin, 1953).

ssp. **scotica** Rowland-Brown

Zygaena achilleae ssp. *scotica* Rowland-Brown, 1919, *Entomologist*, **52**: 225.

Zygaena fulvia ssp. *caledoniae* Verity, 1930, *Mem. Soc. ent. ital.*, **9**: 21.

Zygaena achilleae ssp. *caledonica* Reiss, 1931, *Int. ent. Z.*, **25**: 341.

This interesting subspecies has become extremely rare in its old haunts in West Scotland. However, it was discovered in a little known locality in 1959 (Mere, *in lit.*). I believe that it could be found in many new localities on the coast as it is a species that is easily overlooked.

It was discovered on the Isle of Raasay by Heslop-Harrison (1936), and in all probability it still occurs there. Later, in 1938, it was found by the same entomologist on Eilean nan Each (Heslop-Harrison, 1938). A specimen from Raasay, now in the Tring collection, differs from ssp. *scotica*, as was pointed out by Cockayne, who referred the specimen to the Continental forms (Cockayne, 1936). A long series from the island would be necessary to confirm this opinion.

Zygaena viciae Schiffermüller & Denis

Sphinx viciae Schiffermüller & Denis, 1775, *Wien. Verz.*, p. 45.

Sphinx lonicerae var. Scheven, Esper *nec* Scheven, *Die Schmett.*, **2**: pl. 25, Fig. 3.

Sphinx loti Schiffermüller, Hübner *nec* Schiffermüller, 1799, *Europ. Schmett.*, **1**: pl. 17, Fig. 82 (corrected to *viciae* in text, p. 80, 1805).

Zygaena buglossi Duponchel, 1835, *Hist. Nat. Lep., Suppl.*, **2**: 138.

I previously treated *meliloti* Esper as a synonym of *viciae* S. & D., but the former name should be used for a Continental race of the species. I also treated *meliloti* as **'syn. nov.'**, but credit must be given to Dujardin (1953), who had previously and independently found it to be conspecific with *viciae* S. & D.

ssp. **anglica** Reiss

Zygaena meliloti var. *anglica* Reiss, 1931, *Int. ent. Z.*, **25**: 344.

This subspecies, which was distinct from all the Continental races, is undoubtedly extinct in its old locality, the New Forest.

Zygaena filipendulae Linné

Sphinx filipendulae Linné, 1758, *Syst. Nat.*, 10 ed., p. 494 (with reference to *Fauna Suecica*, p. 256, 1746).

Sphinx filipendula [*sic*] [L.] Poda, 1761, *Ins. Mus. Graec.*, p. 82.

Adscita aries Retzius, 1783, *Gen. Spec. Ins.*, p. 35.

The specimens described by Linnaeus originated from Sweden.

The southern English form is distinct from the nominate race from Sweden and I describe it below as new. It has been known under the name *tutti* Rebel, but this name is a synonym of *stephensi* Dupont, which must be used to represent the local seasonal form occurring in June.

ssp. **anglicola** ssp. nov.

Zygaena filipendulae ssp. *tutti* Rebel, *auctorum nec* Rebel.

♂ 30-35 mm. Head, thorax and abdomen shining bluish- or greenish-black, often covered with short black hair which then obscures the gloss. Forewings glossy, bluish- or greenish-black, with spots scarlet, tinged with crimson. Hindwings scarlet tinged with crimson, with narrow blue-black border, widening at apex and middle of termen. The hindwing border is extremely variable in width and is sometimes absent. Cilia bluish-black.

♀ 34-38 mm. Head, thorax and abdomen shining bluish- or greenish-black. Forewings glossy, greenish- or bluish-black or brassy-green, with spots scarlet, the latter often with traces of crimson. Hindwings scarlet, often with traces of crimson. A narrow blue-black border to the hindwings but often absent. Cilia blue-black.

Holotype: ♂ 'Tring, Herts., 27.vii.06 (A. T. Goodson)'.

Allotype: ♀ with the same data.

Paratypes: 4 ♂♂ and 5 ♀♀ with the same data as the holotype; 9 ♂♂ and 5 ♀♀ labelled 'Aldbury, Tring, Herts. . . . (F. W. Goodson)', with the following dates: 4 ♂♂ and 3 ♀♀ '19.vii.24'; 2 ♂♂ '17.vii.24'; 2 ♀♀ '21.vii.24'; 1 ♂ '14.vii.24'; 2 ♂♂ '15.vii.24'; 1 ♂ and 2 ♀♀ 'Tring, Herts. . . . (A. T. Goodson)', with the following dates: 1 ♂ and 1 ♀ '21.vii.12'; 1 ♀ '8.vii.12'; 1 ♀ labelled 'Tring, 22.vii.1901'; 1 ♂ 'Tring Herts., Dancer's End, 10.vii.94 (A. Goodson)'; 3 ♂♂ and 1 ♀ labelled 'Eynsford, Kent, viii.1912'.

The holotype, allotype and 28 paratypes are in the British Museum collections, 4 paratypes in H. Reiss collection, Stuttgart.

The English *filipendulae* are variable and vary from one locality to another. The description given above is general, as some females are brighter than those described and often the spots and the hindwings are carmine.

f.t. **stephensi** Dupont

Zygaena stephensi Dupont, 1900, *Bull. Soc. Sci. nat. Elbeuf.*, p. 77.

Anthrocera hippocrepidis Hübner, Stephens *nec* Hübner, 1828, *Illus. Brit. Ent.*, **1**: 109.

Zygaena filipendulae v. (? ab.) *tutti* Rebel, 1901, in *Staudinger and Rebel's Cat. Lep.*

This interesting seasonal form is found in May and June, often flying with the early form of *trifolii* Esp. I have had personal experience with one colony only, which I discovered in 1958 on the North Downs in Surrey. Here it flies with the early form of *trifolii* and also with *lonicerae* Scheven, but details of this will form the subject of a future paper on field observations.

Compared with the late *filipendulae* subspecies flying from the end of June to August, *stephensi* is rather smaller, and although somewhat glossy, the colours are much duller, while the ground colour of the forewings is bluish-black, seldom greenish-black.

f. loc. **degenerata** Tremewan

Zygaena filipendulae f. loc. *degenerata* Tremewan, 1958, *Ent. Gaz.*, **9** (4): 192.

Zygaena filipendulae var. *ochsenheimeri* Zeller, Boden *nec* Zeller, 1885, *Entomologist*, **18**: 370.

Zygaena hippocrepidis Hübner, Tutt *nec* Hübner, 1897, *Ent. Rec.*, **9**: 87.

A search was made in 1958 for this interesting local form but without success. It is highly probable that it is is now extinct.

ssp. (? ab.) **lismorica** Reiss

Zygaena filipendulae var. (? ab.) *lismorica* Reiss, 1931, *Int. ent. Z.*, **25**: 345.

I am still not able to ascertain whether *lismorica* is an aberration or a subspecies. In 1959 a visit was made to the Isle of Lismore, but no *filipendulae* were seen; the only *Zygaena* species taken was *purpuralis* ssp. *caledonensis* Reiss (Mere, *in lit.*).

There follow a few notes on other populations of *filipendulae*. Specimens from the Isles of Rhum and Sanday, Inner Hebrides, differ from the southern English race described above chiefly in the thorax and abdomen, which are covered with dull black hair. The ground colour of the forewings is more frequently bluish-black, while the spots and hindwings are pure crimson. It approaches the nominate race from Sweden.

In Ireland *filipendulae* occurs abundantly and is well distributed throughout the country.

Populations from South-West England (Cornwall and Devon) and North Wales (Abersoch) are very bright, with the ground colour of the forewings predominantly glossy-green, especially in the females, while the red coloration is often tinged with warm carmine.

Zygaena lonicerae Scheven

Sphinx lonicerae Scheven, 1777, *Naturf.*, **10**: 97.

Sphinx graminis de Villers, 1789, *Ent. Linn.*, **2**: 115.

The nominate race is from Regensburg.

The southern English form, which was considered typical, is now separated as a distinct subspecies. By some authors it had been placed under *latomarginata* Tutt, but the latter is better treated as a form as it represents only a small proportion of the whole population.

ssp. **transferens** Verity

Zygaena lonicerae race *transferens* Verity, 1926, *Ent. Rec.*, **38**: 59.

Zygaena lonicerae race *britanniae* Verity, 1926, *Ent. Rec.*, **38**: 61.

Verity selected his types from a series collected by Grosvenor at

Tring, Hertfordshire. The species is still found at Tring and in other areas on the Chilterns. Specimens from Kent and Surrey are similar and can be referred to *transferens*. Verity applied the name *britanniae* to specimens from Warthill, Yorkshire; these specimens are distinct from the Filey specimens but are similar to the southern English form, although the red colour is pure crimson without a trace of scarlet. The name *britanniae* Verity is best treated as a synonym of *transferens* Verity.

f. loc. **latomarginata** Tutt

Anthrocera lonicerae var. *latomarginata* Tutt, 1899, *Brit. Lep.*, **1**: 468.

This interesting form from Filey, on the coast of Yorkshire, is distinguished by its large size and broader forewings, while the hindwings have a broad blue-black border.

In England, *lonicerae* is distributed from Kent and Surrey northwards to Yorkshire and westwards to the Cotswolds in Gloucestershire. The records from Cornwall I treat with suspicion; they probably refer to a form of *trifolii*.

I have been able to examine a short series from Armagh, to which I referred in my last paper. These are sufficiently distinct from the English race to be described as a good subspecies.

ssp. **insularis** ssp. nov.

♂ 33-36 mm. Head, thorax and abdomen covered with dense black hair. Forewings greenish- or bluish-black, with the spots scarlet, tinged with crimson. Hindwings scarlet, tinged with crimson, with a fairly wide blue-black border. Antennae long and slender and very pointed with little or no trace of a club.

♀ 34-38 mm. Coloration similar to that in the male, but thorax and abdomen covered with shorter hair, forewing spots larger.

Holotype: ♀ 'Armagh, vii. 1890 ex coll. Tutt'.

Allotype: ♂ with the same data.

Paratypes: 2 ♂♂ and 8 ♀♀ with the same data as the holotype.

The holotype, allotype and 10 paratypes are in the British Museum (Natural History) collections.

According to Tutt (1899) the exact locality is Mullinures, Co. Armagh.

This interesting race is larger than f. *latomarginata* Tutt from Filey, and also differs in having the forewing spots enlarged and elongated, reminding one of *trifolii*, while the antennae are also extremely thin and pointed. The border of the hindwing is constant in width, but narrower than that in *latomarginata* and similar to that in English specimens.

Zygaena trifolii Esper

Sphinx trifolii Esper, 1783, *Die Schmett.*, **2**: 223, pl. 34, Figs. 4, 5.

The type was described from specimens originating from Frankfurt.

ssp. **palustrella** Verity

Zygaena trifolii race *palustrella* Verity, 1926, *Ent. Rec.*, **38**: 11.

Sphinx loti Schiffermüller, Wood *nec* Schiffermüller, 1839, *Index. Ent.*, p. 11 (corrected to *trifolii* in errata).

The early form of *trifolii,* found in England in May and June, is distinct from the nominate race. I have had the opportunity of examining typical specimens which have decidedly thicker scaling and are brighter in colour.

Rather than introduce a new name, I am utilizing a Verity name, which I previously treated as aberrational (Tremewan, 1958). Verity applied the name *palustrella* to specimens collected by Grosvenor in Surrey on 5th and 7th June, 1922. The dates indicate these specimens to be of the early race, and although no exact locality is given I should imagine the area is somewhere on the North Downs, which should be taken as the type locality.

f. loc. **ytenensis** Briggs

Zygaena trifolii ssp. *ytenensis* Briggs, 1888, *Young Nat.*, **9**: 82 (with reference to *meliloti* in error).

Zygaena meliloti Esper, Briggs *nec* Esper, 1888, *Young Nat.*, **9**: 82.

The *trifolii* population of the New Forest appears a little later than ssp. *palustrella* and differs in being densely scaled. I now consider it necessary to separate it as a form, using the name that Briggs applied in 1888.

ssp. **decreta** Verity

Zygaena trifolii race *decreta* Verity, 1926, *Ent. Rec.*, **38**: 57.

Zygaena lonicerae race *misera* Verity, 1926, *Ent. Rec.*, **38**: 73.

Zygaena trifolii ssp. *palustris* Oberthür, *auctorum nec* Oberthür.

Anthrocera meliloti Esper, Stephens *nec* Esper, 1828, *Illus. Brit. Ent.*, **1**: 107.

Anthrocera loti Schiffermüller, Stephens *nec* Schiffermüller, 1828, *Illus. Brit. Ent.*, **1**: 109 (*partim*).

Anthrocera trifolii-major Tutt, 1897, *Ent. Rec.*, **9**: 88 (preoccupied).

The late form of *trifolii* found in July and August in marshes has always been treated as *palustris* Oberth. A comparison of Oberthür's type series with the British populations shows them to be distinct. Oberthür described *palustris* from specimens captured at Rennes, ironically from a locality which is not marshy, viz. in fields and wooded areas. The name *palustris* was originally a manuscript name in the Boisduval collection and, according to Tutt, was applied to a marsh form from the north-west of France. The specimens from Rennes are very large and brightly coloured with carmine spots and hindwings. The race flies in May and June, but cannot be compared with the English race flying at that time.

Again, I am making use of a Verity name rather than introduce a new name to the literature. Verity applied the name *decreta* to specimens collected by Grosvenor in Sussex. These examples are

slightly smaller than the average specimens from marshy localities. Verity stated that the locality produced the black ab. *nigricans* Oberth. quite frequently; from this we can realize that the exact place is Chailey Marsh. Most of the marsh-frequenting forms of *trifolii* found in England can be referred to ssp. *decreta* Verity, of which I consider *misera* Verity to be a synonym.

In England *trifolii* is extremely variable and differs from one locality to another, and very often from colony to colony within a single locality. It may roughly be divided into two groups: (1) ssp. *palustrella* Verity, flying in dry localities in May and June; (2) ssp. *decreta* Verity, flying in marshy localities in July and August, sometimes at the end of June. The New Forest form is best treated as a form of *palustrella*. Tutt pointed out that there is no sharp line of demarcation in the time of appearance of the two groups, and stated that the New Forest form appeared slightly later than *palustrella* (Tutt, 1899).

It is obvious that *trifolii* is a very unstable species, differing from locality to locality, but it is inadvisable to name one population after another, which would lead to describing individual colonies and eventually utter confusion. I suggest treating the English *trifolii* as set out above; if a population from a given locality does not agree exactly with one of the two groups, I advise placing it near the subspecies with which it agrees most in superficial characters; at the same time taking into account the habits and environment of the race.

It is perhaps worth noting that in Cornwall, in addition to the marsh form *decreta*, I have met with a form that flies during July and the beginning of August in dry, rough meadows or on cliff-tops. Observations over a number of years show that the latter population probably originated from the marsh race, but this I hope will be the subject of a future paper on the habits of the British *Zygaena* species.

I give below a systematic list of the British species and subspecies which will be a guide to the reader for the arrangement of his collection:

Zygaena purpuralis Brünn. ssp. *hibernica* Reiss.
Zygaena purpuralis Brünn. ssp. *hibernica* Reiss f. loc. *sabulosa* Tremewan.
Zygaena purpuralis Brünn. ssp. *caledonensis* Reiss.
Zygaena purpuralis Brünn. ssp. *segontii* Tremewan.
Zygaena exulans R. & H. ssp. *subochracea* White.
Zygaena loti S. & D. ssp. *scotica* Rowland-Brown.
Zygaena viciae S. & D. ssp. *anglica* Reiss.
Zygaena filipendulae Linné ssp. *anglicola* Tremewan.
Zygaena filipendulae Linné ssp. *anglicola* Tremewan f. t. *stephensi* Dupont.
Zygaena filipendulae Linné ssp. *anglicola* Tremewan f. loc. *degenerata* Tremewan.
Zygaena filipendulae Linné ssp. (? ab.) *lismorica* Reiss.

Zygaena lonicerae Scheven ssp. *transferens* Verity.
Zygaena lonicerae Scheven ssp. *transferens* Verity f. loc. *latomarginata* Tutt.
Zygaena lonicerae Scheven ssp. *insularis* Tremewan.
Zygaena trifolii Esper ssp. *palustrella* Verity.
Zygaena trifolii Esper ssp. *palustrella* Verity f. loc. *ytenensis* Briggs.
Zygaena trifolii Esper ssp. *decreta* Verity.

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PLATHYPENA SCABRA F. (LEP., NOCTUIDAE) IN BRITAIN

I have been asked to place on record the capture of a male specimen of the American Hypenid moth *Plathypena scabra* F. at mercury vapour light by Mr. C. G. Bruce at Lee, Kent, on 31st August, 1956. The specimen was determined by Mr. D. S. Fletcher of the British Museum (Natural History) after being shown at the Annual Exhibition of the A.E.S. as a melanic *H. rostralis* L., where it was spotted by Mr. E. W. Classey, who suggested that its identity should be checked.

This species is common in the eastern half of North America. The moth flies all the year round, having several broods, and hibernating in the winter. The larva is known as the Green Clover worm; it feeds on clover, bean and other legumes, and also on herbs and strawberry.

The moth is comparable in size and somewhat resembles in pattern *H. obsitalis* Hübn., but may be readily distinguished from this and other British Hypenid species by the raised scales on the postmedial fascia of the forewing, specially conspicuous close to the inner margin.

J. D. BRADLEY.

THE DALE COLLECTION OF BRITISH SIPHONAPTERA

By F. G. A. M. SMIT

Charles William Dale died at Sherborne (not far from his family estate at Glanville's Wootton, Dorset) on 20th February, 1906, at the age of 54. His father, James Charles Dale (repeatedly quoted by J. Curtis in his *British Entomology*) was an ardent naturalist, and the son inherited his interest in natural history in general and in entomology in particular. Like his father, he was a keen collector of insects, and at the age of 18 he also acquired the collection of British insects of his father, who died in 1872.

C. W. Dale's first large publication was his book *The History of Glanville's Wootton, in the County of Dorset, including its zoology and botany*, published in 1878 when he was only 26 years old. This book contains, among others, a list of thirty-eight species of fleas taken by his father and himself at Glanville's Wootton. The list includes no fewer than 23 supposedly new species, each described in a few words which are not of any diagnostic value. For instance, the entire description of *Pulex cuniculi, Ceratophyllus merulae* and of *Ceratophyllus palumbi* reads in each instance 'Pallide piceo-fusca. Long. 1 lin.'; the description for *Ceratophyllus viscivora, C. pyrrhulae, C. atricapillae* and *C. aenas* runs in each case 'Piceo-fusca, pedibus pallidioribus. Long. 1 lin.' However, these meaningless phrases constitute technically valid descriptions, absurd as this may sound.

Dale (*Op. cit.* p. 290) states that he refrained from doing more, 'as it would take up too much room to give long ones [i.e. descriptions]; and besides I hope to write a monograph of them another day'. Students of fleas may well be thankful that this other day, and with it the planned monograph, never arrived.

Kirby, in the *Zoological Record* for 1878 (1880: 245), lists the 23 new species, remarks that the descriptions occupy from two to nine words (actually one species, *Pulex gliris*, is described in 17 words), and draws attention to the mis-spelling of several of the names given by Dale. To this Dale took heed, and he subsequently corrected (in ink) three of the names in his own copy of the book (see Smit, 1952).

A few years before Dale's death Rothschild borrowed from him the type-material of 20 Daleian nominal species (the type-material of the remaining three species was then already lost). Rothschild's examination of the type-material showed that no fewer than 16 of the 20 names given by Dale were synonyms. Dale himself must have lost faith in the value of the descriptions of his 23 species of fleas, for in his List of Diptera of Dorsetshire (1891, 1892) he enumerates 17 species of fleas, which includes only one of his own species (*P. gliris*, 'N.S.').

On the death of C. W. Dale, in 1906, his collection of fleas was presented to the Hope Department of Entomology, in Oxford, and it is housed in the Oxford University Museum. Through the courtesy of Prof. G. C. Varley and Mr. E. Taylor I have recently been able to examine the whole of the Dale collection, comprising 55 mounted specimens and 50 tubes containing 118 specimens in alcohol. Since alcoholic material is much more liable to deterioration or destruction than specimens mounted on slides, and cannot always be identified with absolute certainty, all the alcoholic specimens have now been mounted.

One of the main objects of this re-examination of Dale's collection was to find out which of the type specimens are still in existence and to designate lectotypes where possible.

Below is given a list of what now constitutes the Dale collection of Siphonaptera, the corrected versions of certain names entered by Dale in his own copy of the book being enclosed in square brackets. When Rothschild examined the collection, material of three of Dale's species was missing. Since then the specimens of another seven species of fleas described by Dale have gone astray; the synonymy of several of these species had fortunately already been established by Rothschild.

The species described by Dale in 1878 are listed first in the same order as they appeared in Dale's book. Although in a number of instances Dale labelled a specimen as being a type, he does not mention any type-material in his descriptions, and therefore no specimens (not even the three which already bore red type labels) can be considered as holotypes, with the exception of *Ceratophyllus spini*, of which it seems quite safe to assume that Dale had only one specimen. I have been able to select lectotypes for twelve of the nominal species described by Dale, and these are indicated in the list. For one species (*Ceratophyllus palumbi* Dale, a synonym of *Monopsyllus sciurorum sciurorum* (Schrank)) I had already selected a lectotype (Smit, 1952: 134); in the case of two other species it seemed advisable to erect a neotype. Dale placed the species he mentioned in three genera; 10 in *Pulex* (Linné, 1758), 7 in *Ceratophyllus* (Curtis, 1832), and 21 in *Ceratopsyllus* (Curtis, 1832), but altered the latter name in manuscript to *Ceratophyllus* (see Smit, 1952).

Rothschild (1903: 146) noted that the Dale collection contains 'two specimens received by Mr. J. C. Dale, from Mr. Curtis, of Curtis's own species *Ceratophyllus elongatus*'. Only one male has survived, and I take this opportunity to select this only remaining male of the said species as the lectotype.

Pulex gliris Dale, male LECTOTYPE, from Glanville's Wootton, Dorset, from dormouse (*Muscardinus avellanarius*). A synonym of *Archaeopsylla erinacei erinacei* (Bouché, 1835). Rothschild (1903:

145) mentions another male, now lost, which was identical with *Monopsyllus sciurorum sciurorum* (Schrank, 1803).

Pulex furoris (*furonis;* see Smit, 1952: 133), male LECTOTYPE, and one female from Glanville's Wootton, Dorset, from a ferret (*Mustela putorius*). Rothschild (1903: 145) only saw the male specimen. A synonym of *Nosopsyllus fasciatus* (Bosc, 1800).

Pulex mustelae Dale (now known as *Malaraeus* (*Amalaraeus*) *penicilliger mustelae* Dale)), female LECTOTYPE from *Mustela vulgaris* (= *Mustela nivalis*), Glanville's Wootton, Dorset.

Pulex cuniculi Dale (now known as *Spilopsyllus cuniculi* (Dale)), female LECTOTYPE, from *Lepus cuniculus* (= *Oryctolagus cuniculus*), Glanville's Wootton, Dorset. Additional specimens of *S. cuniculi* in the collection: 2 ♀, 1876, *Mustela nivalis*; 1 ♂ 5 ♀, *Oryctolagus cuniculus*; all from Glanville's Wootton.

Ceratopsyllus sorecis (*soricis*—see Smit, 1952: 133) Dale. Rothschild (1903: 145) states that the type is a male which is identical with *C. minor* Dale. This type is no longer in the Dale collection, which in fact now contains no specimens of the species which is now generally known as *Palaeopsylla soricis*. There is one female labelled *Ceratophyllus soricis*, I. 1844, from a shrew, but this is actually a specimen of *Leptopsylla segnis* (Schönherr, 1811). Whether, in these circumstances, the name *soricis* should ever have been applied to the *Palaeopsylla* occurring on shrews in Europe is doubtful, but to make any change now would be most undesirable. As Dale's description was of material from 'shrews' (in the plural), he must have had more than one specimen, and it is convenient to assume that a specimen, now lost, belonged to the species to which the name is now universally applied. It must also be remembered that Rothschild did not record the date (if Dale mentioned one on the label) on which the specimen was collected and that it is now lost and the date no longer ascertainable, so there is no guarantee that the specimen which Rothschild examined was a syntype and not a specimen collected after the description had been published. This is obviously a case in which a neotype should be erected and I have chosen as neotype of *Palaeopsylla soricis soricis* (Dale, 1878) a specimen agreeing with Dampf's figures (Dampf, 1910: 620, Figs. C, D) from the Rothschild collection in the Zoological Museum at Tring, bearing as data: Bath, Somerset, 11-15.v.1914, from *Sorex araneus*, K. Jordan, NEOTYPE, ♂. This neotype has been figured in a paper in which the subspecies of *P. soricis* are dealt with (Smit, 1960: Figs. 10, 15).

Ceratopsyllus minor Dale (now known as *Palaeopsylla minor* (Dale)); male LECTOTYPE, from mole (*Talpa europaea*), Glanville's Wootton, Dorset. Other specimens in the collection belonging to the same species are: 1 ♂, 2.i.1835, *Neomys fodiens*; 1 ♀, 1876, *Mustela nivalis*; 2 ♂ 5 ♀, *Talpa europaea*; all from Glanville's Wootton.

Ceratopsyllus gallinulae Dale (now known as *Dasypsyllus gallinulae*

gallinulae (Dale)). According to Rothschild (1903: 145) the type was a female which is now lost. Since it is known which species is meant by *C. gallinulae* a neotype should be designated, and I have selected as such a specimen from the Dale collection with the following data: *Ceratophyllus gallinulae* Dale, Glanville's Wootton, Dorset, from long-tailed tit (*Aegithalos caudatus*), NEOTYPE ♀.

Ceratopsyllus monedulae Dale, female LECTOTYPE, and two other females, from Glanville's Wootton, Dorset, from a jackdaw (*Corvus monedula*). A synonym of *Ceratophyllus gallinae gallinae* (Schrank, 1803).

Ceratopsyllus turdi Dale, male LECTOTYPE, from Glanville's Wootton, Dorset, from a song thrush (*Turdus ericetorum*). A synonym of *Ceratophyllus gallinae gallinae* (Schrank, 1803). According to Rothschild (1903: 145) there was also a female specimen, now lost, of this species, which was identical with *Dasypsyllus gallinulae gallinulae* (Dale, 1878).

Ceratopsyllus viscivora (recte *viscivori*) Dale. The type was already lost in 1903. The flea or fleas of this name came from the nest of a stone thrush (*Turdus viscivorus*), in which the two common fleas are *Ceratophyllus gallinae* (Schrank) and *Dasypsyllus gallinulae* (Dale). I suggest that *C. viscivori* Dale, 1878, be regarded as a synonym of *Dasypsyllus gallinulae gallinulae* (Dale, 1878).

Ceratopsyllus merulae Dale, male LECTOTYPE, and two females, from Glanville's Wootton, Dorset, from a blackbird (*Turdus merula*). A synonym of *Dasypsyllus gallinulae gallinulae* (Dale, 1878). There are two other females of *C. merulae*, from Glanville's Wootton, no host given, which are identical with *Ceratophyllus gallinae gallinae* (Schrank, 1803).

Ceratopsyllus garruli Dale. The type, now lost, was stated by Rothschild (1903: 145) to have been a female which was identical with *Ceratophyllus gallinulae* Dale.

Ceratopsyllus pyrrhulae Dale. As in case of the preceding species, the type, now lost, was stated by Rothschild (1903: 146) to be a specimen of *Ceratophyllus gallinulae* Dale.

Ceratopsyllus citrinellae Dale, female LECTOTYPE, and one other female, from Glanville's Wootton, Dorset, from yellowhammer (*Emberiza citrinella*). A third specimen mentioned by Rothschild (1903: 146) is no longer in the Dale collection. A synonym of *Dasypsyllus gallinulae gallinulae* (Dale, 1878).

Ceratopsyllus pratensis Dale, male LECTOTYPE, and one other male, from Glanville's Wootton, Dorset, 26.v.1840, from field pipit (*Anthus pratensis*). A synonym of *Ceratophyllus gallinae gallinae* (Schrank, 1803), not of *Ceratophyllus gallinulae* Dale, 1878, as erroneously stated by Rothschild (1903: 146). There is also a female *C. pratensis*, from Glanville's Wootton, Dorset, 28.v.1840; this is identical with *Ceratophyllus garei* Roths., 1902.

Ceratopsyllus atricapillae Dale. The single female, now lost, was

stated by Rothschild (1903: 146) to be the same as *Ceratophyllus gallinulae* Dale.

Ceratopsyllus cinereae Dale, female LECTOTYPE, Glanville's Wootton, from a whitethroat (*Sylvia communis*). A synonym of *Dasypsyllus gallinulae gallinulae* (Dale, 1878). Rothschild (1903: 146) mentions that there were two males and three females of *C. cinereae* identical with *D. g. gallinulae*, but only one female with the same data as the lectotype exists now; there are two other females, collected on 18.v.1840, host not recorded, which also prove to belong to *D. g. gallinulae*. As noticed by Rothschild, one male *C. cinereae*, collected at Glanville's Wootton, on 17.v.1865 from *Sylvia communis* is identical with *Ceratophyllus gallinae gallinae* (Schrank, 1803).

Ceratopsyllus arvensis Dale. The type was already lost in 1903. Based on material from nests of skylarks (*Alauda arvensis*), in which several species of fleas may occur, it would be convenient to regard *C. arvensis* Dale as a synonym of *Dasypsyllus gallinulae gallinulae* (Dale, 1878).

Ceratopsyllus trochili Dale. Of this species, too, the type material was already lost in 1903. Stated by Dale to have been found in willow-wren's (*Troglodytes troglodytes*) nests. Like the preceding species, *C. trochili* Dale would best be regarded as a synonym of *Dasypsyllus gallinulae gallinulae* (Dale, 1878).

Ceratopsyllus caudati Dale. Rothschild (1903: 146) noted that there were two females, now lost, of this species which were identical with *Ceratophyllus gallinulae* Dale.

Ceratopsyllus spini Dale, female HOLOTYPE, from Glanville's Wootton, Dorset, 9.ii.1863, from a siskin (*Carduelis spinus*), J. C. Dale leg. A synonym of *Ceratophyllus gallinae gallinae* (Schrank, 1803). Rothschild records only this single female, and since Dale states that *C. spini* was taken off a siskin, it is unlikely that more than one specimen was collected; hence it seems appropriate to regard the specimen as a holotype.

Ceratopsyllus aenas (recte *aenadis*; see Smit, 1952: 133) Dale, female LECTOTYPE, Glanville's Wootton, Dorset, 23.v.1873, from a stock-dove (*Columba oenas*). A synonym of *Ceratophyllus gallinae gallinae* (Schrank, 1803). Rothschild (1903: 146) states that 'the two specimens of this species are identical with *Ceratophyllus gallinae*', but there are two other female specimens, with the same data as the lectotype, which are identical with *Monopsyllus sciurorum sciurorum* (Schrank, 1803).

Ceratopsyllus palumbi Dale. According to Rothschild (1903: 146) there were two male specimens of this species. One of the specimens was 'an undoubted example of *Ceratophyllus sciurorum*, while the other represents a new and obviously unrecognized form. The name *palumbi*, belonging as it does to a composite species, and in consequence the new species should be redescribed'. As remarked by Smit (1952: 133) Rothschild's rejection of the name as composite was

not the correct way of dealing with the matter. 'His action in redescribing the *Ceratophyllus* as *dalei* (1903, *Entomologist,* **36**: 297) has, however, been generally accepted as restricting the name *palumbi* to the *Monopsyllus,* and (to avoid unnecessarily upsetting current nomenclature) I hereby select the *Monopsyllus* as lectotype of *Ceratophyllus palumbi* Dale, 1878, thus making it a synonym of *Monopsyllus sciurorum* (Schrank, 1803)' (Smit, 1952: 133-134). The specimen has now been properly labelled as the lectotype of *Ceratophyllus palumbi* Dale. The other specimen, which was in the Dale collection when Rothschild saw it, is the holotype of *C. dalei* Rothschild, December, 1903 (a synonym of *C. rusticus* Wagner, May, 1903), and is in the Rothschild collection at Tring; evidently Dale gave it to Rothschild at the time the latter described it.

The remainder of the Dale collection consists of representatives of 21 species described and named by other authors. Most of these specimens were misdetermined, and it seems certain that Dale's determinations were based almost wholly on the host-record, though it is possible he used a hand-lens in examining fleas. There were also four specimens each of which bore a different unpublished name. Since manuscript names have no status in zoological nomenclature and Dale's misdeterminations have no practical value to-day, all these specimens are listed below under the correct names of the species concerned. All the specimens were collected at Glanville's Wootton unless otherwise stated, and the hosts are listed under their scientific names in place of the vernacular names used by Dale.

Archaeopsylla erinacei erinacei (Bouché)—1 ♀, 24.ix.1874, *Sciurus vulgaris;* 3 ♂ 5 ♀, without further data.

Ctenocephalides canis (Curtis)—3 ♀, 31.xii.1862; 2 ♀, without further data.

Ctenocephalides felis felis (Bouché)—2 ♂ 3 ♀, without further data.

Pulex irritans L.—2 ♂ 14 ♀, without further data.

Hystrichopsylla talpae talpae (Curtis)—1 ♂, 4.ix.1889, from nest of fieldmouse; 1 ♂, Longburton Sheen (3 miles N.-W. of Glanville's Wootton), 1879.

Ctenophthalmus nobilis nobilis (Rothschild)—2 ♂ 8 ♀, 23.v.1873, *Sturnus vulgaris* (*sic*); 1 ♀, *Microtus agrestis*; 1 ♀, without further data.

Rhadinopsylla pentacantha (Rothschild)—1 ♂, Tring, Herts., 14.v.1900, *Mustela nivalis,* N. C. Rothschild (probably presented by Rothschild in exchange for the specimen on which his description of *Ceratophyllus dalei* is based).

Leptopsylla segnis (Schönherr)—2 ♀, 1883, mouse [*Mus musculus*]; 1 ♀, I.1844, shrew; 1 ♂, bat [rat?]; 2 ♀, *Mus musculus.*

Ischnopsyllus elongatus (Curtis)—1 ♂ LECTOTYPE, off the yellow bat [*Nyctalus noctula*], received by J. C. Dale from J. Curtis; 1 ♂, without further data.

Ischnopsyllus hexactenus (Kolenati)—1 ♂ 1 ♀, *Plecotus auritus*.

Ischnopsyllus octactenus (Kolenati)—1 ♀, *Pipistrellus pipistrellus*; 1 ♀, bat.

Ischnopsyllus simplex simplex Rothschild—1 ♂ 1 ♀, without further data.

Nycteridopsylla longiceps Rothschild—1 ♂ 1 ♀, *Plecotus auritus*.

Dasypsyllus gallinulae gallinulae (Dale)—1 ♀, 1889, nest of *Erithacus rubecula*; 1 ♀, *Certhia familiaris;* 1 ♂, *Fringilla coelebs*; 1 ♀, without further data.

Nosopsyllus fasciatus (Bosc)—1 ♂ 2 ♀, *Rattus norvegicus*; 3 ♂ 2 ♀, without further data.

Megabothris walkeri (Rothschild)—1 ♂ 2 ♀, 1876, *Mustela nivalis*.

Monopsyllus sciurorum sciurorum (Schrank)—1 ♂ 1 ♀, 24.ix.1874, *Sciurus vulgaris*; 1 ♀, 15.viii.1862; 1 ♀, without further data.

Ceratophyllus farreni Rothschild—3 ♂ 5 ♀, *Delichon urbica*; 1 ♂, *Hirundo rustica*.

Ceratophyllus gallinae gallinae (Schrank)—3 ♂ 15 ♀, without further data.

Ceratophyllus garei Rothschild—1 ♀, 20.vi.1840, *Emberiza calandra;* 1 ♂, duck.

Ceratophyllus hirundinis (Curtis)—3 ♀, 31.v.1873, *Delichon urbica*; 1 ♀, nest of *Delichon urbica*; 1 ♂ 1 ♀, *Hirundo rustica*.

Ceratophyllus rusticus Wagner—2 ♀, 31.v.1873, *Delichon urbica*; 3 ♀, *Hirundo rustica*.

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THE LECTOTYPE OF *THYA MAURUS* CURTIS, 1834 (*BERAEA MAURUS* CURTIS, 1834) (TRICHOPTERA, BERAEIDAE)

By D. E. KIMMINS
Department of Entomology, British Museum (Natural History)

In connection with an application to the International Commission on Zoological Nomenclature (Kimmins, 1959), it was considered desirable to verify that the type of *Thya maurus* Curtis conformed to the present-day concept of this species. The Curtis Collection of British Insects is now preserved in the National Museum of Victoria, Melbourne, and the author most gratefully acknowledges the kindness of the Director of that Museum, Dr. C. W. Brazenor, in authorizing the loan of the type series of *Thya maurus* for study.

Mr. A. Neboiss, Assistant Curator of Insects at the National Museum of Victoria, informs me that this series now contains seven specimens above a printed label '4 *maurus* Curt'. The latter label is probably cut from Curtis' *Guide to an arrangement of British Insects*. These seven specimens have been sent to me and I list below my determinations of them, numbered in the order in which they were arranged in the cabinet in Melbourne.

Specimen No. 1. This is a male example of *Lype phaeopa* (Stephens) (family Psychomyidae).

Specimen No. 2. I believe this male also to be *Lype phaeopa* (Stephens), although the dorsal process of the tenth segment is more slender than in Specimen No. 1. The apical fork M_1 in the fore wing appears to be about as long as its footstalk, and fork M_3 has a definite footstalk.

Specimen No. 3. This is a male example of *Ernodes articularis* (Pictet) (family Beraeidae).

Specimen No. 4. This is a female example of *Beraea maurus* (Curtis) (family Beraeidae). Although rather badly pinned, the warts on the mesoscutellum are visible and one of the scutal warts has fortunately been missed by the pin.

Specimen No. 5. This is a male example of *Beraea maurus* (Curtis). It bears a small manuscript label '9 July' and what appears to be the word 'Turk'.

Specimen No. 6. This is a female *Beraea*, probably *maurus* (Curtis), but the mesoscutellar warts have been obscured by the pin. For certain identification it would be necessary to make a preparation of the abdomen.

Specimen No. 7. This is a female *Agapetus*, probably *fuscipes* Curtis (family Rhyacophilidae). It bears the label 'out of sallows, side of Killarney'.

Curtis' type series of *Thya maurus* thus contains examples of four species in four different genera and three families. It is, of course, quite possible that some of these specimens may not have been part of the original type series, but have been added at some later date. To conform with the current usage of the name *Beraea maurus* (Curtis, 1834), I am hereby designating Specimen No. 5 as LECTOTYPE ♂ and Specimen No. 4 as LECTOALLOTYPE ♀ of *Thya maurus* Curtis, 1834. The lectotype and allotype have been so labelled by myself and will continue to be housed in the National Museum of Victoria, Melbourne.

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A RECORD OF *LYMANTRIA DISPAR* L. (LEP., LYMANTRIIDAE) FROM SUSSEX

I have been requested by Mr. R. R. Pickering to record on his behalf the capture of a male Gipsy Moth (*Lymantria dispar* L.) at light on 29th August, 1960, at Aldwick Bay, Bognor Regis, Sussex.

The other records known to me of this species being taken in recent years are from Margate in July, 1950; Dover in July, 1951; and one from Hampshire in August, 1955. It would be of interest to learn if other captures have gone unrecorded.

J. D. BRADLEY

HERSE CONVOLVULI L. (LEP., SPHINGIDAE) IN MIDDLESEX

On the morning of 25th September, 1960, I took a male specimen of the Convolvulus Hawk Moth from the m.v. trap in my garden here.

It was in fine condition and was given to Mr. R. I. Lorimer; it is now in his collection.

22 Harlington Road East,
Feltham, Middlesex. E. W. CLASSEY

FERTILE EGGS LAID BY FEMALES OF *DYTISCUS MARGINALIS* L. LONG SEPARATED FROM MALES

By DOROTHY J. JACKSON, F.R.E.S., F.L.S.

Wesenberg-Lund (1943) gives a useful summary of the breeding habits of *Dytiscus marginalis* L. He states (p. 289) that the soft young beetles are to be found during July and August, and that pairing (p. 278) takes place principally in autumn, the spermatozoa keeping alive in the receptaculum seminis of the female throughout the winter. Oviposition does not usually commence before the spring, the eggs being fertilized just before laying. After the spring oviposition, he states that there is a resting period of many months, and in February the following year eggs are again ripe. He thinks it is doubtful whether a female still lays eggs in the third year. It is well known that *Dytiscus* imagines are long-lived, and Blunck (1924) refers to a record of the survival of one specimen of *D. marginalis,* fed on raw beef, for 3½ years. He concludes that the normal span of life is 1-2 years. Joly (1945) calculates the imaginal life as being from 2-4 years.

For several years I have kept females of *D. marginalis* in captivity in order to obtain eggs for rearing the Mymarid, *Caraphractus cinctus* Walker. I have thus collected some data on oviposition, and on the presumed survival of spermatozoa within the female, which seem of sufficient interest to record. The present note concerns eight females which Professor H. G. Callan kindly gave me on 25th May, 1956. These beetles had been collected a few days previously in a pond in East Fife. Each beetle was placed in a separate receptacle and supplied with shoots and leaves of various plants for oviposition, as already described (Jackson, 1958b). The beetles were principally fed upon earthworms, and when laying they eat a lot; thus three worms about 1½ inches long were consumed by a laying female in 24 hours.

Only three of these females laid in 1956, the period of oviposition extending from the end of May until early July. After this I placed the females in two large metal barrels in the garden, the beetles that had not laid in one barrel, while the three that had laid were put in the other, together with a female from Surrey received from Mr. R. M. Mere in March, 1956, which had also laid during April and May. The barrels were newly established and each was covered with a closely fitting lid of fine-meshed wire, secured with a heavy metal ring, making escape impossible and equally debarring the entrance of any large beetle. The following spring (1957) the beetles were alive, and I added the leaves of various plants that had never been in water, such as flag iris from my garden, *Luzula sylvatica* Gaud, shoots of various coarse grasses, *Phragmitis* and *Carex otrubae Podh.* This avoided any possibility of the introduction of 'wild' *Dytiscus* eggs. In both barrels fertile eggs were laid in these plants from April to June, 1957, though the females had now been isolated from males for a year.

The four beetles that had already laid in 1956 and in 1957 did not survive a second winter, but the history of the other five females is interesting. In the spring of 1957, as mentioned above, numbers of eggs were found in the foliage placed in this barrel, and many eggs brought indoors hatched. Two females were placed in separate jars in order to obtain eggs laid under conditions suitable for my parasite experiments; both laid and the eggs were fertile. They were replaced in the barrel at the end of May. All five females were alive and active on 3rd August, 1957, and two full-grown *Dytiscus* larvae were found in the barrel and removed. The fact that the barrel was kept full of water and that no pupation site was available, precluded the possibility of any larvae attaining the imaginal state. The five beetles were kept in the barrel for a second winter and four were seen alive on 7th April, 1958; one found dead at the end of April was removed. Leaves and shoots of various plants were added from the end of March onwards, and eggs were laid again in April and May, 1958. Some of the eggs were brought indoors for observation, and I have records of 15 hatching, but eight out of nine eggs laid on iris leaves failed to develop. The beetles had now been isolated from males for two years. On 17th June, 1958, the barrel was emptied and the mud from the bottom was spread out and searched. Three living females were recovered from the water and the abdomen of another was found which, with the dead specimen already removed, made up the original number.

The three surviving females were then placed in individual jars and kept in a cold north room. One died in September, 1958, the other two survived a third winter, one living till the end of June, 1959. Only one of these females was laying in the spring of 1959, and the few eggs she laid were all infertile. They showed no signs of development and decayed. On 21st April I added a newly collected male (which was seen upon the female a few days later), and by 26th April fertile eggs were being laid. Up till the middle of May 24 eggs were deposited which duly hatched, but after this some 40 eggs laid until the middle of June were almost all unhealthy. Perhaps in this case mating had stimulated oviposition. Blunck states that the females normally mate several times a year and he considers that this provides a stimulus for oviposition.

In all probability these two long-lived females had emerged in the summer of 1955 and were likely to be already nine months old when captured in May, 1956, so I estimate their age as three years and ten months. Blunck records that old *Dytiscus* become overgrown with commensal Protozoa, but these old females were as clean and healthy looking as newly collected specimens.

The results of my observations thus show that fertile eggs were obtained from *Dytiscus marginalis* after two years isolation from males. I presume that these females had been mated before capture in 1956, and that the spermatozoa had survived within the receptacu-

lum seminis of one or more females for at least two years. Possibly the period was even longer, for pairing may have occurred in the autumn of 1955, taking into account Wesenberg-Lund's statement (as quoted above) that mating occurs principally in the autumn. The same writer mentions that in the honey bee the spermatozoa can live 4-5 years in the receptaculum seminis of the queen. The present record of the laying of fertile eggs two years after isolation from males would appear to be the longest known for a *Dytiscus* female. In my view it indicates the prolonged survival of the spermatozoa, but Mr. J. Balfour-Browne, who has kindly read over the typescript of this note, considers that there is a strong possibility that some of the fertile eggs were the product of parthenogenetic development. However, Blunck (1924, p. 166) notes that four females of *Dytiscus* separated from males in August, 1911, after one year of normal sexual activity, between 1st March and 1st April, 1912, laid 13, 18, 25 and 36 eggs respectively, which gave normal larvae; but that virgin females were, as was to be expected, altogether incapable of the production of embryos capable of development. In *Agabus bipustulatus* L. I observed that a collected female, isolated for a year, laid during that period over 1,700 eggs, and only amongst the last 18 deposited were the majority infertile (Jackson, 1958a). I later placed a male with this female and she laid thereafter 93 more eggs, nearly all fertile. This case is parallel to that of the three-year-old *Dytiscus* female here recorded and seems to me explicable on the assumption that the supply of spermatozoa (presumably received before capture) had at last become exhausted since fertility was renewed in both females after mating.

It is clear from these observations that, in the Dytiscidae, collected females long isolated from males may continue to lay fertile eggs over long periods. In nature this capacity is likely to be a factor of importance in favouring the successful dispersal of a species, and will be especially valuable in the colonization of new waters.

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THE LARVAE OF THE BRITISH HEXATOMINI (DIPT., TIPULIDAE)

By ALLAN BRINDLE, F.R.E.S., AND DEREK BRYCE, Ph.D.

INTRODUCTION

The larvae of the *Hexatomini* form a rather distinctive group of the Tipulidae. They usually have smooth cylindrical bodies which taper anteriorly and are more or less truncate posteriorly. They are active, the head capsule, in the carnivorous species, being continually exserted and retracted during progression. The colour is uniformly brownish, yellowish, or whitish, rarely green (*Hexatoma*), and this tends to vary even in larvae of the same species. A covering of fine pubescence occurs on the cuticle, sometimes being so thick as to give an iridescent appearance to the larva, or being so scanty that the gut contents are visible through the cuticle. Some larvae possess prominent welts on the ventral surface which assist locomotion, and a characteristic feature of others is the ability to inflate the penultimate segment, thus affording anchorage in an unstable substrate (Fig. 13, h). The general habitat is marshy or wet soil, the exceptions to this being referred to in the text.

The structure of the larvae corresponds to the classification adopted in Kloet and Hincks (1945), except that the subgenus *Idioptera* cannot readily be separated from the subgenus *Phylidorea,* and the subgenus *Pilaria* may be easily separated into three groups (viz. *Pilaria* s.s., the *nemoralis* group, and the *filata* group), each of which may be regarded as having subgeneric status on the basis of larval characters. The genus *Ula,* though usually placed in the Pediciini, is included in this paper since the larval characters agree with those of the Hexatomini. This placing agrees with the views of Alexander (1920).

The larvae of the Hexatomini (with the exception of the *filata* group) may be separated from the rest of the larvae of the Tipulidae by the number of lobes on the truncated end of the anal segment. This bears four lobes, sometimes with an additional reduced fifth dorsal lobe, contrasting with the Tipulinae (six lobes), the Eriopterini (five subequal lobes), the Pediciini (two lobes), and the Limoniini (in which the lobes are often reduced and indistinct, or sometimes, as in *Helius,* they have five subequal lobes). The larvae of the Cylindrotominae are sufficiently distinctive in the possession of toothed, tuberculate, or filiform appendages on the body. The species of the *filata* group appear to have the lobes permanently closed so that the anal segment appears to be conical (Fig. 10a).

The key separates the larvae into genera, subgenera, and species-groups. Wherever possible use has been made of macroscopic characters as well as characters of the head capsule. Following the key, the characters of the genera, subgenera and species-groups are outlined separately together with notes on the separation of species within

the groups in so far as this is possible with the present state of our knowledge of the larvae and with the material available. In general it is possible to assign the living larvae to subgenera or species groups, and, only in some cases, to species.

Anal segment

The anal segment is truncate posteriorly and possesses a spiracular disc with two spiracles (i.e. the larvae are metapneustic). The disc is surrounded by four lobes, sometimes with a reduced fifth dorsal lobe, and these are capable of holding a bubble of air when the larvae burrow in mud or sand, or they can assist buoyancy when the aquatic larvae rise to the surface film. This buoyancy is assisted by long marginal setae which often occur on the lobes. The pigmentation of the lobes, and the length and distribution of the setae offer useful aids to identification. The distinctive anal segment in the *filata* group has been referred to above.

Ventrally the anal segment bears four whitish fleshy anal papillae arranged around the anus. The form and size of these vary in different species, from small ovoid papillae to long, parallel-sided ones. Larvae living in wetter media tend to have longer papillae.

In order to examine the anal segment, living larvae should be immersed in water, when the anal papillae and spiracular lobes will be fully extended. Larvae to be preserved should be killed by immersion in hot water (60°-70° C.), which usually ensures that the anal segment will be fully extended. Afterwards they may be kept in Pampel's fluid or in 70 per cent alcohol. Most other methods of killing result in retraction of the anal segment.

Head capsule

The form of the mouth parts shows great diversity and reflects various adaptations to modes of feeding. The non-carnivorous forms have a massive head capsule in which the hypostomial region is developed as a toothed plate and the mandibles bear two rows of teeth. The number of teeth in the latter forms is least in those larvae feeding on the hardest material (wood). The carnivorous larvae have the head capsule more or less dissected, and the hypostomial region is either non-sclerotized or developed as a transverse bar attached to a system of connecting rods which allow of expansion of the head during swallowing.

KEY TO GENERA, SUBGENERA, AND SPECIES-GROUPS

1. Abdominal segments 2-7 with a basal creeping welt (Fig. 4a); spiracular disc usually with five lobes; if with four, then body segments with small tubercles 2
– Abdominal segments 2-7 without creeping welts; spiracular disc with four lobes, sometimes with a reduced fifth dorsal lobe, or without obvious lobes 5
2. Body without raised tubercles; hypostomium with three to seven teeth; larvae in decayed wood or fungus 3

– Body segments with raised tubercules; hypostomium with nine teeth; larvae on wet rock faces (hygropetricous) ... *Dactylolabis*

3. Each lobe of spiracular disc with a sclerotized plate (sometimes indistinct on dorsal lobe) 4

– Lobes of spiracular disc not sclerotized; hypostomium with three strong teeth; in decayed wood ..... *Epiphragma*

4. Lateral and ventral lobes of spiracular disc produced; sclerotized plate on dorsal lobe vertically elongate; plates of lateral lobes contiguous with spiracles and transversely elongate; antennae very small with two apical papillae; hypostomium with seven teeth; in fungus ..... *Ula*

– Lateral and ventral lobes of spiracular disc not produced; dorsal lobe with a somewhat indistinct transverse sclerotized area; plates of lateral lobes not transversely elongate; antennae with a single apical papilla; in decayed wood ..... *Austrolimnophila*

5. Anal papillae not longer than width of anal segment, *or,* ventral lobes of spiracular disc without a distal group of exceedingly long setae; head capsule more or less dissected; mandibles with a long curved apical tooth; hypostomium absent or developed as a transverse bar, never a toothed plate 7

– *Either* anal papillae each longer than width of anal segment, *or,* ventral lobes of spiracular disc with a distal group of exceedingly long setae; head capsule compact; mandibles with a number of distal teeth, developed in two rows; hypostomial plate toothed and divided in the mid line 6

6. Anal papillae parallel sided, each longer than width of anal segment; margin of spiracular disc fringed with long setae; spiracles normal, well separated; ventral lobes long, parallel sided, black and heavily sclerotized on upper surface; each half of hypostomial plate with seven or eight teeth; mandibles stout with seven distal teeth and a preapical comb of setae; cuticle with a delicate pubescence and erect setae ..... *Pseudolimnophila*

– Anal papillae not longer than width of anal segment; margin of spiracular disc fringed with very long setae; spiracles large, separated by a distance less than the width of one of them; ventral lobes triangular, with brown sclerotization on their inner face and distally with a group of exceedingly long setae arising from obvious punctures; each half of hypostomial plate with three or four teeth; mandibles with a pair of preapical setae (no comb); cuticle with a delicate pubescence and small tubercles each with a pencil of stout erect setae ..... *Oxydiscus*

7. Larvae whitish, yellow or brown; marginal hair fringe of spiracular disc, if differentiated, always more extensive on ventral lobes; labrum without setose projections from each anterior lateral angle; apical papillae of antennae either spirally sculptured or else smooth (*Limnophila* sens. lat.) 8

– Larvae greenish; marginal hair fringe of spiracular disc more

extensive on lateral lobes and present only as an apical tuft on ventral lobes. Labrum with a setose projection at each anterior lateral angle; apical papilla of antenna slender, with annular sculpturing; hypostomial region not sclerotized ..... *Hexatoma*

8. Anal segment truncate, lobes of spiracular disc obvious 9
– Anal segment bluntly conical, without obvious lobes; labrum anteriorly with a fringe of short setae in the middle and, on each side, a setiferous and papillate tubercle; antennae with two subequal apical setae; mandibles with three similar teeth at the distal third of the concave side ..... *filata* group
9. Lobes of spiracular disc subequal, relatively short, or all very long, narrow and pointed 10
– Ventral lobes of spiracular disc longer than lateral lobes, and lobes not very long, narrow and pointed 12
10. Lobes of spiracular disc not long and pointed; reduced fifth dorsal lobe present; antenna not distally membranous and apical papilla with delicate spiral sculpturing 11
— Lobes of spiracular disc long and pointed, hairy, totally unsclerotized; antennae sclerotized proximally, membranous distally, with an unsculptured apical papilla; mandibles with four or more teeth as well as the apical tooth; labrum anteriorly with a pair of clear protuberances bearing each three small papillae .... *Elaeophila*
11. Anal papillae ovoid, white; lobes of spiracular disc with dark margin; antennae relatively broad, apical papilla small; apical tooth of mandible curved almost through 90 degrees .... *nemoralis* group
— Anal papillae elongate, narrow at tips; lobes of spiracular disc uniformly sclerotized, yellowish brown; antennae with two unequal apical setae; labrum with a pair of clear circular areas containing small papillae just behind the anterior margin; proximal tooth of concave side of mandible foliaceous *Limnophila* s.s.
12. Anal papillae twice as long as broad, tapering at tip; antennae with two apical setae; hypostomial region not sclerotized; mandibles hinged at the middle; plates of head capsule less dissected, firmly united dorsally ..... *Pilaria* s.s.
— Anal papillae usually ovoid, white; antennae relatively short with one apical seta; hypostomium developed as a transverse bar; mandibles not hinged, with a long apical tooth and on the concave side a truncate blade and a triangular tooth; epipharynx with a pair of two-jointed papillae ... *Phylidorea* and *Idioptera*

DESCRIPTIONS OF LARVAE

Genus *Dactylolabis* O.S. (Figs. 1, a-f)

Body depressed, dark pigmented, with numerous short dark setae and having a tuberculated appearance. Four pointed anal papillae. Spiracular disc with four lobes each with a sclerotized plate.

Head capsule massive, dark pigmented. Labrum largely pale with a stout seta near each posterior lateral angle and a sclerotized transverse bar anteriorly with a seta at each extremity. Close to the latter there is a pair of pale areas each containing four small papillae. Epipharynx clothed with numerous scale-like setae. Antennae with a sensory 'ring organ' near the base and one large and two very small apical papillae. Mandibles stout with seven apical teeth arranged in two rows and two 'accessory teeth' on a projection proximal of the ventral row of teeth. Mandibular brush of setae well developed. Maxillae not modified, lacinial lobe fringed with setae. Hypostomial plate with nine dark teeth. Labium-hypopharynx well developed with spines and papillae anteriorly and many scales on the posterior dorsal region.

The two British species may be distinguished as follows:

1. Yellowish, each body segment with an oblique dorso-lateral black line. Sclerotized plates of spiracular disc almost uniformly dark pigmented (Fig. 1, f). Four long pointed anal papillae on a white fleshy pedicel. Antennae noticeably longer than wide (Fig. 1, a). On wet gritstone rocks ..... *D. transversa* (Mg.)
– Greyish, each body segment with an oblique dorso-lateral brownish black line. Sclerotized plates of spiracular disc dark pigmented only around their margins (Fig. 1, e). Anal papillae short, not on a fleshy pedicel. Antennae not much longer than wide (Fig. 1, c). On wet, limestone rocks ..... *D sexmaculata* (Macq.).

Genus *Epiphragma* O.S. (Fig. 2, a-d)

Body white, with prominent creeping welts on abdominal segments 2-7. Spiracular disc mainly white with five unsclerotized lobes of which the ventral pair are the longest. Margin of disc fringed with short setae. Spiracles separated by a distance of about twice their diameter and each surrounded by a narrow sclerotized area. A faint darkish patch occurs between each spiracle and the mid-line. The anal papillae are retractile (Fig. 2, d).

Head massive and dark-pigmented. Labrum (Fig. 2, b) with a median area of pitted appearance and a pair of stout setae ventral to the anterior edge. Antero-laterally the margin is setose, and posterior to this fringe there is a stout seta and a pale area enclosing three pegs. Antennae small with a 'ring-organ' proximal of the middle and ending in a kidney-shaped papilla with four minute pegs near its base (Fig. 2, b). Mandibles (Fig. 2, a) with three teeth on the dorsal cutting edge and one on the ventral edge. Maxilla (Fig. 2, c) with the lacinial lobe densely clothed with setae and with three strong and one weak setae on the subcardo (posterior sclerite). Hypostomial plate (Fig. 2, c) with three strong dark teeth.

Only one British species, *E. ocellaris* (L.), in dry wood of fallen trees, usually in the cortical wood.

Genus *Ula* Hal. (Fig. 4, a-b)

The main characters of this genus are outlined in the key. To these the following features may be added: Mandibles with five teeth on the ventral cutting edge and three teeth dorsally. Dorsal lobe of spiracular disc with a sclerotized plate which tapers after its middle and then continues ventrally of uniform thickness to a truncate termination.

For a fuller account see Bryce (1957).

Only one British species, *U. sylvatica* (Mg.). In fungi (e.g. *Polyporus squamosus* L.).

Genus *Oxydiscus* de Meij. (Fig. 3, a-d)

Body covered with a delicate pubescence and with small tubercles from each of which arises a pencil of erect setae. Spiracular disc relatively small surrounded by four lobes each of which is margined by a sclerotized area. Spiracles large, separated by a distance less than the diameter of one of them. Margin of spiracular disc entirely fringed by very long setae. Distal region of each ventral lobe with a group of punctures from which arise exceedingly long setae (Fig. 3, a).

Head capsule massive. Mandibles (Fig. 3, c-d) with seven apical teeth in two rows and a pair of subapical setae as well as a pair of setae on the proximal convex region. Hypostomium (Fig. 3, b) a divided toothed plate, median pair of teeth small, three lateral teeth on each side large.

Five British species. The above account is based on a larva from Dr. H. E. Hinton. The larvae probably occur in woodland mud.

Genus *Austrolimnophila* Alex. (Fig. 5, a-d)

Only one British species, *A. ochracea* (Mg.), in wood of fallen trees, often occurring together with *Epiphragma ocellaris*.

The larvae outwardly resemble those of *Epiphragma ocellaris* but may be readily distinguished by the presence of distinct sclerotized plates on the spiracular disc (Fig. 5, d). Head capsule massive and dark-pigmented. Antennae (Fig. 5, b) over twice as long as wide with a 'ring organ' at the proximal third and a button-like apical papilla. Mandibles (Fig. 5, a) stout with five strong apical teeth arranged in two rows with a concave region between them. Hypostomium (Fig. 5, c) with three strong dark teeth, and lateral to these the subcardo of the maxilla bears two stout setae and a puncture, and proximally a weak seta arising from another puncture.

Genus *Pseudolimnophila* Alex. (Fig. 6, a-f)

Body covered with a delicate pubescence. Spiracular disc with four lobes of which the ventral pair are long and narrow. Margin of disc fringed with long setae (Fig. 6, a). Anal papillae long and slender (Fig. 6, d).

Head capsule massive. Mandibles short and relatively broad with several blunt apical teeth, a preapical comb of setae and a proximal

brush of long setae (Fig. 6, b). Maxillae not greatly modified. Hypostomium a divided sclerotized plate (Fig. 6, e). Hypopharynx a sclerotized arch with numerous teeth on the anterior margin (Fig. 6, f).

Only two British species, *P. lucorum* (Mg.) and *P. sepium* Verrall. *P. lucorum* (Mg.): Antennae over three times as long as wide with a 'ring organ' at the proximal fifth, two equal long apical setae, and a spirally sculptured apical papilla. Mandibles with five ventral and two dorsal teeth and a preapical comb of about six setae. Each half of hypostomial plate with eight teeth (Fig. 6, e), the whole unicolorous yellow.

In marshy soil, generally saturated, or with standing water.

Genus *Hexatoma* Latr. (Fig. 7, a-e)

Larvae greenish with an iridescent pubescence. Spiracular disc with four lobes of which the ventral pair are longest. Each lobe with a narrow brown line which is expanded at its inner end. Four anal papillae. Dorsal margin of disc and margins of dorsal lobes fringed with long setae. Setae of ventral lobes confined to an apical tuft amongst which are four longer, stouter setae.

Head moderately massive but dorsal plates dissected from behind. Antennae long with a narrow annular sculptured apical papilla and two unequal setae (Fig. 7, a). Labrum (Fig. 7, a) with a setose projection at each anterior-lateral angle. Labrum-epipharynx with two strong tubercles each with three apical papillae, and between these tubercles numerous setae and two longer setae each arising from a small tubercle. Mandibles falciform with a long apical tooth and three smaller teeth near the middle of the concave side of which the distal tooth has near to it a small projection bearing two small papillae (Fig. 7, c). Maxilla with outer lobe prolonged and flattened. Hypostomial region not sclerotized.

The two British species may be separated as follows:

1. Greenish; cuticular pubescence light; pigmented patches on spiracular disc separated by a wide space, wider dorsally, the greatest width equal to the diameter of the spiracles (Fig. 7, e). Larvae larger. In sand of river beds or banks ... *H. bicolor* (Mg.)
– Brownish green; cuticular pubescence dark; pigmented patches on spiracular disc closely approximated, separated by a narrow space, not greater than width of spiracular border (Fig. 7, b). In sand of river beds or banks ..... *H. fuscipennis* (Curt.)

Genus *Limnophila* Macq. For a preliminary account see Brindle (1958)

A carnivorous group.

Spiracular disc with four lobes with marginal setae developed on ventral pair. Ventral lobes longer than dorsal *or,* dorsal and ventral lobes subequal *or,* lobes of spiracular disc not obvious, apparently permanently closed so that the spiracular chamber is hidden.

Head capsule not massive, always more or less dissected from behind. Antennae either with a spirally sculptured apical papilla or

else distally membranous with an unsculptured apical papilla. Hypostomial region either not sclerotized or with a narrow transverse bar, never with a toothed plate. Mandibles falciform, sometimes hinged.

This is a heterogeneous group which may be readily separated into a number of sub-genera and species-groups.

Subgenus *Pilaria* Sintenis s.s. (Fig. 8, a-d)

Ventral lobes of spiracular disc much longer than dorsal lobes. Anal papillae twice as long as broad, broad at base, tapering towards tip. Entire margin of spiracular disc fringed with long setae, especially long from the tips of the ventral lobes.

Plates of head capsule united dorsally, less dissected than in the remaining sub-genera. Dorsal plate spatulate posteriorly. Antennae (Fig. 8, d) with an elongate basal segment bearing one or two apical setae and a relatively long sculptured papilla. Mandibles (Fig. 8, c) hinged, basally broad, distally with a falciform blade resembling a sub-chela. The latter blade bears a number of proximal teeth. On the basal part, proximal of the hinge, there are a number of long blades and setae. Maxillae densely hairy. Hypostomial region not sclerotized.

Of the four British species only *P. discicollis* (Mg.) and *P. scutellata* Staeg., have been examined.

nemoralis-group (*Limnophila* subgen. *Pilaria*) (Fig. 9, a-d)

This group may be regarded as having the status of a subgenus.

Lobes of spiracular disc sub-equal and anal papillae small, ovoid. Antennae with the basal joint about twice as long as broad with a small narrow sculptured apical papilla, a long seta and three very small papillae. Epipharynx anteriorly with a pair of two-jointed papillae between which are three conical projections. Mandibles with a long apical tooth curved almost at right angles to the main axis and a number of teeth in the angle thus formed. Maxillae with an apically membranous blade.

Of the two British species only *L. nemoralis* (Mg.) has been examined. *L. nemoralis* (Mg.): Antennae as in Fig. 9, b. Mandibles (Fig. 9, a) with four teeth in the angle formed by the apical tooth, the two distal being ovoid, the two proximal triangular.

Spiracular disc (Fig. 9, c); anal papillae (Fig. 9, d).

filata-group (*Limnophila,* subgen. *Pilaria*) (Fig. 10, a-e)

This group may be regarded as having the status of a subgenus.

Anal segment conical, spiracular lobes not visible (Fig. 10, a). Antennae (Fig. 10, d) with the basal joint over three times as long as broad with a proximal 'ring organ'. Apical papilla sculptured, about half the width of the basal joint and almost a third as long. Apex of antennae also with two long setae. Labrum (Fig. 10, e) anteriorly with a few short setae in the middle and on each side a tubercle with a short apical papilla. Mandibles with a long curved apical tooth, and, distal of the middle of the concave face, three

bluntly acute teeth. Hypostomium developed as a short transverse bar. Maxillary blade apically membranous.

The two British species may be separated as follows:

1. Concave margin of apical mandibular tooth smooth (Fig. 10, b). ..... *L. batava* Edw.
– Concave margin of apical mandibular tooth serrated (Fig. 10, c). ..... *L. filata* (Walk.).

Subgenus *Elaeophila* Rond. (Fig. 11, a-m)

Anal papillae small, ovoid (Fig. 11, l-m). Lobes of spiracular disc subequal, long and pointed (Fig. 11, h-m). Larvae covered with a delicate pubescence.

Antennae (Fig. 11, e) basally sclerotized with a proximal 'ring organ' and distally membranous with a small unsculptured apical papilla. The antennae superficially resemble the maxillary blades. Labrum (Fig. 11, a) anteriorly with a median pair of setiferous tubercles and on each side a clear protuberance bearing small papillae. On each side of each protuberance there is an elongate conical papilla. The blunt anterior lateral angles are clothed in setae. Mandibles with a long curved apical tooth and a number of teeth on the concave side of which the distal pair are narrow and pointed and the next tooth is broad and triangular. Proximal of the latter tooth there are one or more teeth. The hypostomium is developed as a transverse bar (Fig. 11, b).

Of the six British species *E. mundata* (Loew.) appears to be doubtful (Coe, 1950) and *E. apicata* (Loew) closely resembles the remaining members of the subgenus. The head capsule of the latter species has not been examined. The larvae occur in soil by rivers and streams.

E. verralli (Bergroth): The median pair of labral setae are almost as long as the clear protuberances (Fig. 11, a). Mandibles (Fig. 11d) with a single triangular tooth proximal to the large triangular tooth of the concave side.

E. maculata (Mg.): Mandibles (Fig. 11, g) similar to those of *E. verralli*.

E. trimaculata (Zett.): The median pair of labral setae are stout, longer than the clear protuberances. A 'foliaceous' tooth lies proximal to the large triangular tooth of the concave side of the mandible (Fig. 11, f).

E. submarmorata (Verrall). The median pair of labral setae are very small and the lateral papillae not contiguous with the clear protuberances. Mandibles (Fig. 11, e) with three narrow pointed teeth proximal of the large triangular tooth of the concave side.

Subgenus *Limnophila* s.s. (Fig. 12, a-e)

Larvae with the anal papillae twice as long as broad, broad at base, tapering towards tip (Fig. 12, d). The four lobes of the spiracular disc subequal, with a slight development of a fifth dorsal lobe (Fig. 12, e).

Antennae (Fig. 12, a) elongate with a proximal ring organ and an apical pair of unequal setae, two very small papillae and a sculptured papilla about half as long as the preceding joint. Labrum (Fig. 12, c) anteriorly with very short setae and a pair of long stout setae near to each of which there is a clear circular area containing four small papillae. Anterior lateral angles obtuse, fringed with long setae. Mandibles (Fig. 12, b) with a long stout curved apical tooth and, on the concave side, a distal tubercle with a truncate blade or tooth, a narrow pointed tooth, and, proximally, a wide 'foliaceous' blade or tooth.

Of the two British species only *L. punctata* (Schr.) has been examined, and the above description is based on the examination of material of this species. The other species, *L. pictipennis* (Mg.) has been described by Beling (1878) and by Brauer (1883).

Subgenera *Phylidorea* Bigot and *Idioptera* Macq. (Fig. 13, a-m)

The larvae in the subgenus *Phylidorea* closely resemble those in the subgenus *Idioptera,* so that they are best dealt with as one group.

Ventral lobes of spiracular disc longer than dorsal lobes. Anal papillae usually small and ovoid (in *P. fulvonervosa* (Schum.) the anal papillae are longer).

Antennae usually less than two and a half times as long as wide with a 'ring organ' at the proximal third, a relatively large sculptured apical papilla and a very long seta. Labrum-epipharynx (Fig. 13, f) anteriorly with a pair of two-jointed 'epipharyngeal palps' lateral to each of which there are one or two setiferous tubercles followed by a number of small tubercles, some of which have apical papillae. Anterior lateral angles obtuse, but almost describing a right angle, with numerous long setae and one longer and stronger seta. Mandibles (Fig. 13, a) with a long, curved apical tooth and on the concave side a truncate blade or tooth and a larger triangular tooth. Maxillary blade apically membranous. Hypostomium developed as a transverse bar with a pair of 'palps' (Fig. 13, g).

Phylidorea, 11 British species; *Idioptera,* 2 British species. The following key separates only six species and should therefore be regarded as tentative:

1. Spiracular disc with a dark pigmented patch to outer side of spiracles and extending on to basal part of lateral lobes (Fig. 13, l-m) 2
– Spiracular disc without a dark pigmented patch to outer side of spiracles extending on to basal part of lateral lobes 5
2. Dark pigmented stripes from lateral lobes not connected to stripes on ventral lobes 3
– Dark pigmented stripes from lateral lobes connected to stripes on ventral lobes 4
3. Dorsum of anal segment patterned with dark pubescence. (Triangular tooth of mandible broad and constricted at base. Basal

joint of antenna over twice as long as broad; apical papilla over half as long as basal joint.) ..... *P. meigeni* Verrall

– Dorsum of anal segment unicolorous. (Triangular tooth of mandible broad, only slightly constricted at base. Basal joint of antenna less than 1½ times as long as broad, apical papilla almost as long.) ..... *P. lineola* (Mg.)

4. Stripe on ventral lobe wider; anal papillae longer. (Triangular tooth of mandible broad, not constricted. Basal antennal joint about 1½ times as long as broad; apical papilla about half as long as basal joint.) ..... *P. fulvonervosa* (Schum.)

– Stripe on ventral lobe narrower; anal papillae short, ovoid. (Triangular tooth of mandible relatively narrow. Apical papilla of antenna about three-quarters as long as basal joint.) ..... *P. ferruginea* (Mg.)

5. Ventral lobes short, about as long as broad at base (Triangular mandibular tooth narrow. Basal joint of antenna less than twice as long as broad; apical papilla almost as long.) ..... *P. squalens* (Zett.)

– Ventral lobes longer, always longer than the width of the base. (Triangular mandibular tooth narrow. Basal antennal joint not much longer than broad; apical papilla almost as long.) ..... *I. pulchella* (Mg.)

All the above larvae in wet soil. *P. meigeni, P. squalens* and *I. pulchella* occur in *Sphagnum* and peaty soil on moors.

ACKNOWLEDGMENTS

We wish to thank Dr. H. E. Hinton for making available a larva of the genus *Oxydiscus* for examination and inclusion in this paper.

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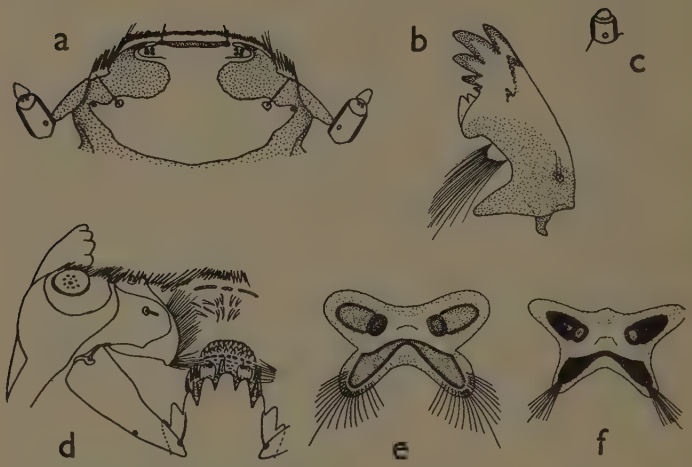
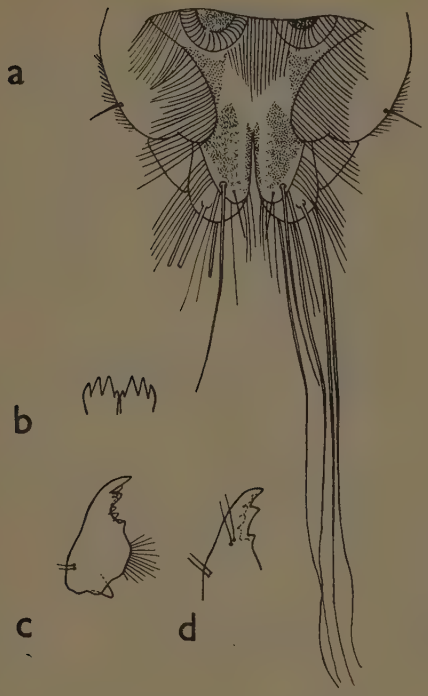


DACTYLOLABIS spp.

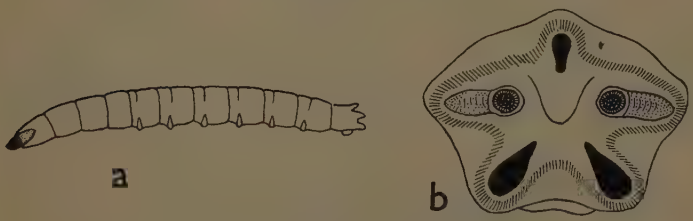
Fig. 1: (a) *D. transversa,* labrum and antennae. (b) *D. transversa,* mandible. (c) *D. sexmaculata,* antenna. (d) *D. sexmaculata,* anterior ventral view of part of head. (e) *D. sexmaculata,* spiracular disc. (f) *D. transversa,* spiracular disc.

EPIPHRAGMA OCELLARIS L.

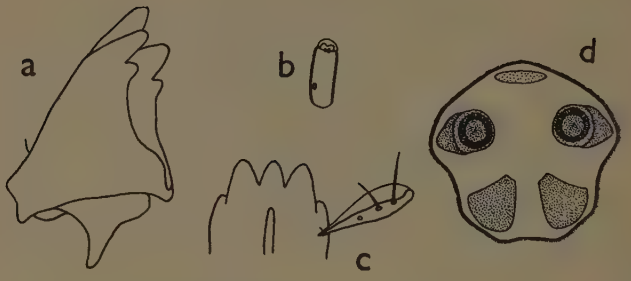
Fig. 2: (a) mandible. (b) labrum and antenna. (c) hypostomium and maxilla. (d) spiracular disc.



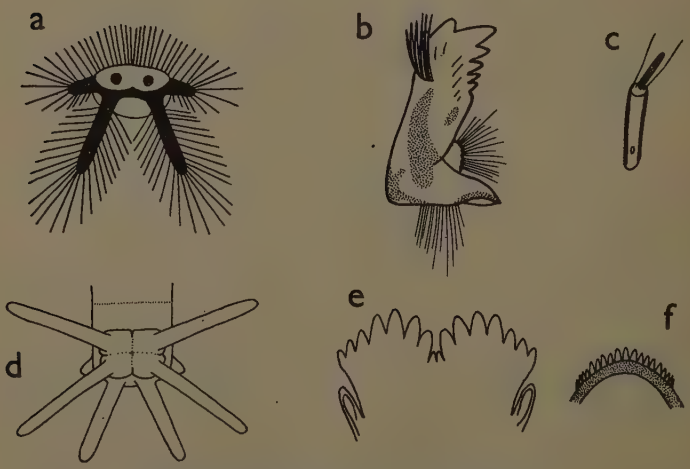
OXYDISCUS spp.
Fig. 3: (a) spiracular disc. (b) hypostomium. (c) mandible, dorsal. (d) mandible, ventral.



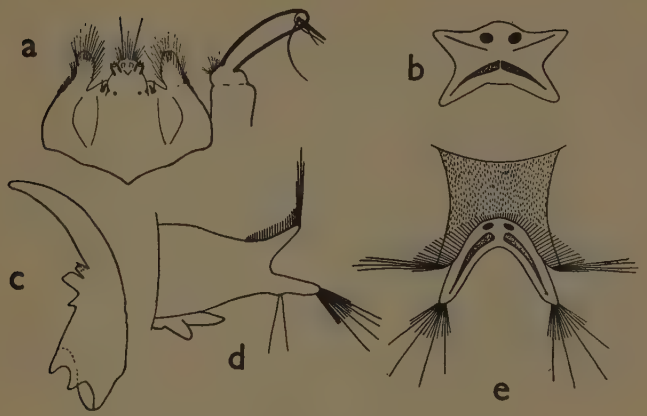
ULA SYLVATICA Mg.
Fig. 4: (a) Larva, lateral view. (b) spiracular disc.



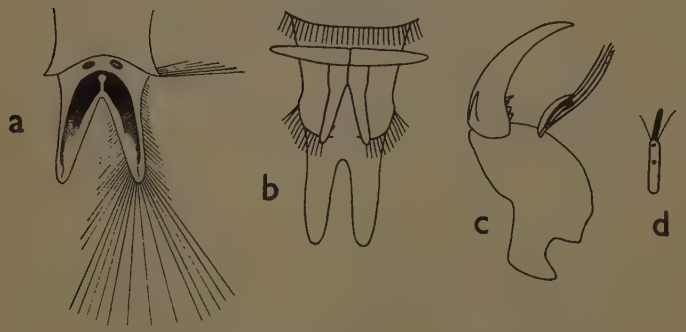
AUSTROLIMNOPHILA OCHRACEA Mg.
Fig. 5: (a) mandible. (b) antenna. (c) hypostomium and subcardo of maxilla. (d) spiracular disc.



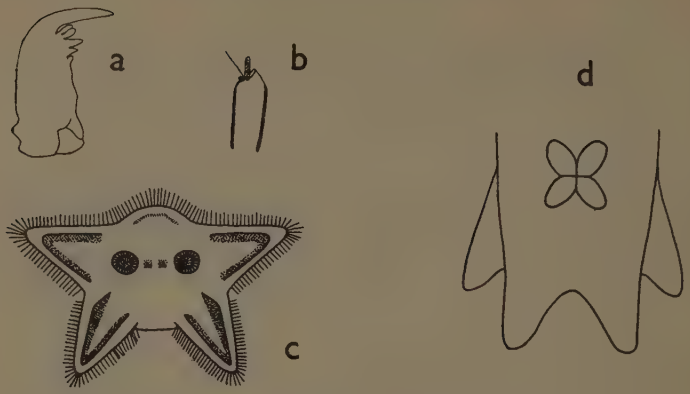
PSEUDOLIMNOPHILA LUCORUM Mg.
Fig. 6: (a) spiracular disc. (b) mandible. (c) antenna. (d) anal papillae. (e) hypostomium. (f) hypopharynx.



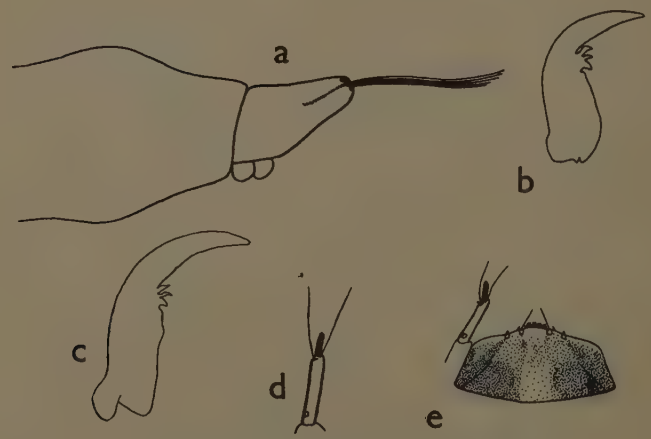
HEXATOMA spp.
Fig. 7 (a) *H. bicolor*, labrum and antenna. (b) *H. fuscipennis*, spiracular disc. (c) *H. bicolor*, mandible. (d) *H. bicolor*, anal segment, lateral view. (e) *H. bicolor*, anal segment, dorsal view.



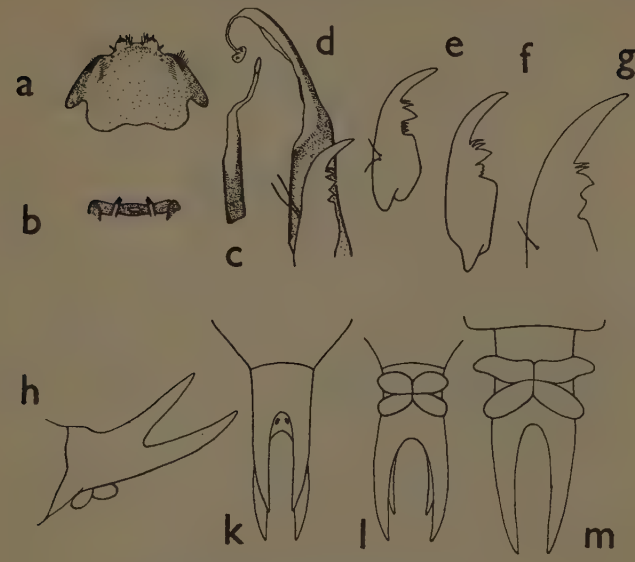
LIMNOPHILA (*PILARIA*) *DISCICOLLIS* Mg.
Fig. 8: (a) anal segment, dorsal view. (b) anal segment, ventral view. (c) mandible. (d) antenna.



LIMNOPHILA (PILARIA) NEMORALIS Mg.
Fig. 9: (a) mandible. (b) antenna. (c) spiracular disc. (d) anal segment, ventral view.

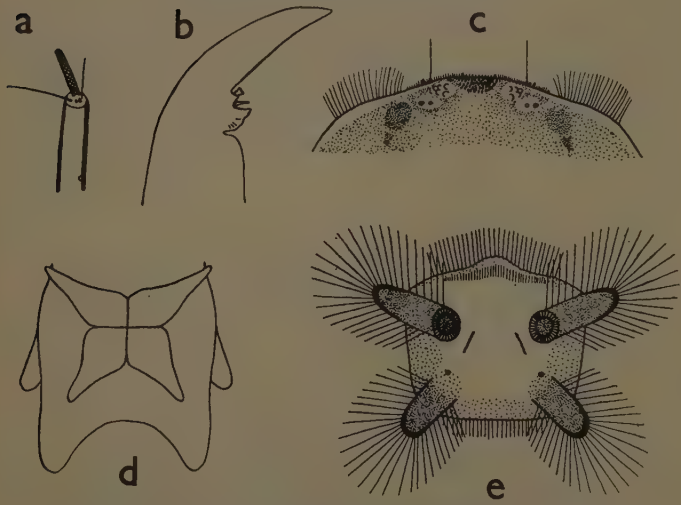


LIMNOPHILA (PILARIA) FILATA GROUP
Fig. 10: (a) *L. batava,* anal segment, lateral view. (b) *L. batava,* mandible. (c) *L. filata,* mandible. (d) *L. filata,* antenna. (e) *L. batava,* labrum.



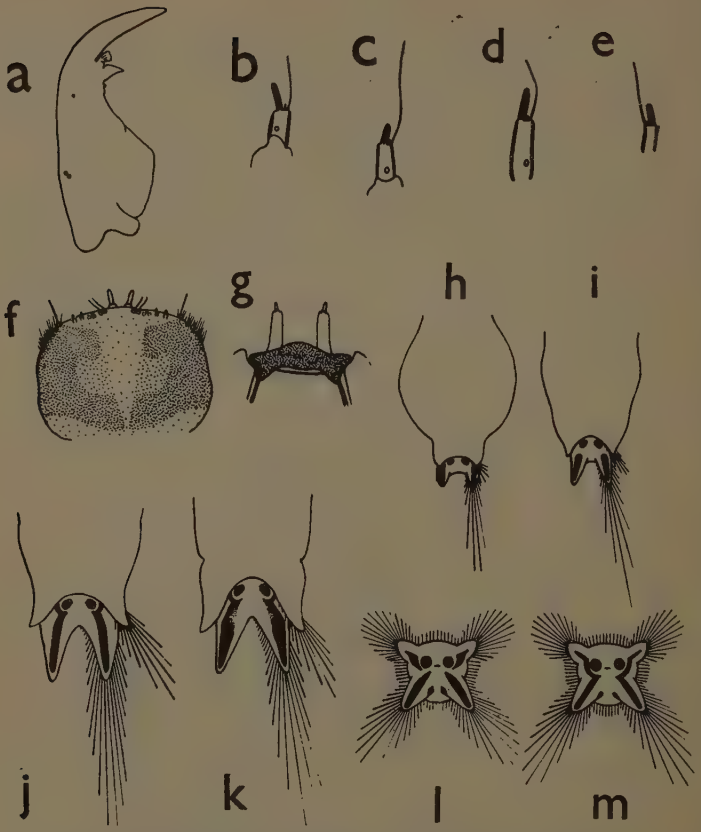
SUBGENUS *ELAEOPHILA*

Fig 11: *For explanation see page 224.*



LIMNOPHILA (*LIMNOPHILA*) *PUNCTATA* Schr.

Fig. 12: (a) antenna. (b) mandible. (c) labrum. (d) anal papillae. (e) spiracular disc.



SUBGENERA *PHYLIDOREA* AND *IDIOPTERA*

Fig. 13: (a) *lineola,* mandible. (b) *lineola,* antenna. (c) *fulvonervosa,* antenna. (d) *meigeni,* antenna. (e) *pulchella,* antenna. (f) *lineola,* labrum. (g) *lineola,* hypostomium. ((h) *squalens,* anal segment, dorsal view. (i) *pulchella,* anal, segment, dorsal view. (j) *ferruginea,* anal segment, dorsal view. (k) *fulvonervosa,* anal segment, dorsal view. (l) *lineola,* spiracular disc. (m) *ferruginea,* spiracular disc.

Fig. 11: (a) *E. verralli,* labrum. (b) *E. verralli,* hypostomium. (c) *E. verralli,* antenna. (d) *E. verralli,* maxilla and mandible. (e) *E. submarmorata,* mandible. (f) *E. trimaculata,* mandible. (g) *E. maculata,* mandible. (h) *E. verralli,* anal segment, lateral view. (k) *E. verralli,* anal segment, dorsal view. (l) *E. verralli,* anal segment, ventral view. (m) *E. maculata,* anal segment, ventral view.

REVISED INDEXED CHECK-LIST OF THE BRITISH LEPIDOPTERA

By I. R. P. HESLOP, M.A.

PART II

(Pyraloidea and Tortricoidea)

Introductory Note to Part II

While in the main retaining my previous order for the Pyraloidea, I have in the Tortricoidea brought the sequence of species into conformity with that exemplified in Mr. J. D. Bradley's lists. In both super-families, in consultation with Mr. P. E. S. Whalley and Mr. Bradley respectively, the generic and specific nomenclature has been revised in detail. There have been a few adjustments and modifications of English names in the Tortricoidea, to suit both taxonomic and nomenclatural research.

The concept of the sub-families remains my own.

I have, as in the whole list, fully seized myself of the rulings stated in *The Entomologist,* Vol. 90, pp. 162-163.

In the Pyraloidea the so-called 'gender' of certain generic names has long presented a problem. Authors have been constrained to inflect the specific name in order to 'agree' with any change or shift in generic name. To combat this, and to secure some degree of permanence and uniformity, I have conceived the idea of making—in the groups concerned—the specific name *agree with the name-genus of the sub-family.* Thus in the Scopariinae the specific names conform in gender to *Scoparia,* in the Crambinae to *Crambus,* in the Platyptiliinae to *Platyptilia,* in the Pterophorinae to *Pterophorus,* and so on. I am aware that this may be considered a bold step, but I am glad to have the opportunity of making it (which I do on my own responsibility); and I hope that this treatment may be found acceptable. Actually, but few of the terminations of the specific names, as shown in my previous edition, have had to be altered so as to obtain this principle.

In addition to those entomologists named previously, I wish to express my obligation—both direct and in respect of Mr. Bradley's interpretation of his work—to Dr. N. S. Obraztsov. Further, I must record my most grateful thanks to Mr. P. E. S. Whalley for so generously making over to me, for incorporation in my own list, his manuscript list of the Pyraloidea. The name of Mr. W. G. Tremewan is to be added to those mentioned at page 164 of the *Entomologist's Gazette,* Vol. 9. I renew my thanks to Mr. Tams and Mr. Fletcher for invaluable assistance so kindly accorded in the checking, respectively, of the Noctuoidea and the Geometroidea.

It appears that in the Introductory Note to Part I, I overstated the formal position with regard to Goeze. This statement was based

on information furnished: but in fact Goeze's work has not as yet been so suppressed. Such action has been recommended previously and probably will be so again; but has not yet been formally adopted. Meanwhile, I am continuing in the process of eliminating Goeze names from my list.

I. R. P. HESLOP.

'Belfield,'
Burnham-on-Sea, Somerset.
18th July, 1960.

REVISED INDEXED CHECK-LIST OF THE BRITISH LEPIDOPTERA

by I. R. P. HESLOP, M.A.

PART II

Super-family PYRALOIDEA

PYRALIDAE

SCHOENOBIINAE

*970 **Schoenobius gigantellus** Schiff.
Gigantic Water-veneer

*971 **Donacaula forficellus** Thunb.
Pale Water-veneer

972 **Donacaula mucronellus** Schiff.
Scarce Water-veneer

*973 **Acentropus niveus** Ol. (*garnonsii* Curt.)
False-caddis Water-veneer

SCOPARIINAE

*974 **Eudorea resinea** Haw.
Resin Grey

975 **Eudorea lineola** Curt.
Striped Grey

976 **Eudorea angustea** Steph.
Narrow-winged Grey

977 **Eudorea vafra** Meyr.
Meyrick's Grey

978 **Eudorea murana** Curt.
Wall Grey

979 **Eudorea mercurea** Haw. (*frequentella* Staint.)
Small Grey

*980 **Dipleurina crataegella** Hübn. (*centurionalis* Hübn.)
Whitethorn Grey

*981 **Witlesia borealis** Tengst. (*alpina* Staint.)
Alpine Grey

982 **Witlesia pallida** Steph.
Marsh Grey

*983 **Scoparia cembrae** Haw. (*zelleri* Knaggs)
Large Grey

984 **Scoparia dubitalis** Hübn. (*ingratella* Knaggs)
Hoary Grey

985 **Scoparia basistrigalis** Knaggs
Mottled Grey

986 **Scoparia ambigualis** Treits. (*atomalis* Doubl.)
Brown Grey

987 **Scoparia ulmella** Knaggs (*conspicualis* Hodgk.)
Elm Grey

988 **Scoparia truncicolella** Staint.
Rustic Grey

NYMPHULINAE

*989 **Cataclysta lemnata** L.
Small China-mark

*990 **Nymphula stagnata** Don.
Beautiful China-mark

991 **Nymphula nymphaeata** L. (*potamogalis* L.)
Brown China-mark

*992 **Parapoynx stratiotata** L.
Ringed China-mark

*993 **Diasemia litterata** Scop.
Lettered China-mark

994 **Diasemia ramburialis** Dup.
Rambur's China-mark

*995 **Dolicharthria punctalis** Schiff. (*longipedalis* Curt.)
Long-legged China-mark

*996 **Eurrhypara hortulata** L.
(*urticata* L.)
Magpie China-mark

PYRAUSTINAE

*997 **Antigastra catalaunalis** Dup.
Catalonian Rosy Pearl

*998 **Palpita unionalis** Hübn.
Scarce Olive-tree Pearl

*999 **Hymenia recurvalis** F.
(*fascialis* Schiff.)
Beet Pearl

*1000 **Agrotera nemoralis** Scop.
Beautiful-bordered Pearl

*1001 **Nomophila noctuella** Schiff.
(*hybridalis* Hübn.)
Rush Veneer Pearl

*1002 **Pyrausta cingulata** L.
Silver-barred Sable

1003 **Pyrausta nigrata** Scop.
Wavy-barred Sable

1004 **Pyrausta sanguinalis** L.
Scarce Crimson-and-gold

1005 **Pyrausta purpuralis** L.
Common Crimson-and-gold

1006 **Pyrausta ostrinalis** Hübn.
Scarce Purple-and-gold

1007 **Pyrausta aurata** Scop.
General Purple-and-gold

1008 **Pyrausta cespitalis** Schiff.
(*reticularis* auct.)
Straw-barred Sward Pearl

1009 **Pyrausta funebris** Stroem
(*octomaculata* L.)
White-spotted Sable

*1010 **Epicorsia repandalis** Schiff.
Scarce Straw Pearl

*1011 **Nascia cilialis** Hübn.
Orange-rayed Pearl

*1012 **Opsibotys fuscalis** Schiff.
Cinereous Pearl

*1013 **Udea fulvalis** Hübn.
Fulvous-dot Pearl

1014 **Udea lutealis** Hübn.
Pale Straw Pearl

1015 **Udea ferrugalis** Hübn.
Rusty-dot Pearl

1016 **Udea nivealis** F.
(*prunalis* Schiff.)
Dusky Brindled Pearl

1017 **Udea alpinalis** Schiff.
(*uliginosalis* Steph.)
Alpine Pearl

1018 **Udea decrepitalis** H.-S.
Scotch Brindled Pearl

1019 **Udea olivalis** Schiff.
Olive Brindled Pearl

*1020 **Ostrinia nubilalis** Hübn.
(*lupulinalis* Guen.)
Cloudy Wormwood Pearl

*1021 **Pachyzancla aegrotalis** Zell
(*mutualis* Zell.)
Bolton Pearl

*1022 **Haritala ruralis** Scop.
(*verticalis* Schiff.)
Mother of Pearl

*1023 **Perinephela coronata** Hufn.
(*sambucalis* Schiff.)
Garden Elder Pearl

1024 **Perinephela perlucidalis** Hübn.
Lucid Pearl

1025 **Perinephela lancealis** Schiff.
Long-winged Pearl

1026 **Perinephela stachydalis** Zinck.
Woundwort Pearl

1027 **Perinephela verbascalis** Schiff.
Golden Pearl

*1028 **Mecyna flavalis** Schiff.
Auriferous Pearl

1029 **Mecyna asinalis** Hübn.
Madder Pearl

*1030 **Microstega pandalis** Hübn.
Bordered Pearl

1031 **Microstega hyalinalis** Hübn.
Translucent Straw Pearl

1032 **Microstega terrealis** Treits.
Northern Pearl

*1033 **Ebulea crocealis** Hübn.
Small Ochreous Pearl

1034 **Ebulea pulveralis** Hübn.
Powdered Pearl

*1035 **Uresiphita polygonalis** Schiff.
(*gilvata* F.)
Yellow-underwinged Pearl

*1036 **Loxostege sticticalis** L.
Diamond Spot Pearl

*1037 **Sitochroa verticalis** L.
(*cinctalis* Treits.)
Lesser Pearl

1038 **Sitochroa palealis** Schiff.
(*flaveolata* auct.)
Sulphur Pearl

*1039 **Cynaeda dentalis** Schiff.
Starry Brindled Pearl

*1040 **Evergestis pallidata** Hufn.
(*straminalis* Hübn.)
Chequered Straw Pearl

1041 **Evergestis extimalis** Scop.
Marbled-yellow Straw Pearl

*1042 **Mesographe forficalis** L.
Garden Pebble

PYRALINAE

*1043 **Endotricha flammealis** Schiff.
Rosy-flounced Tabby

*1044 **Herculia glaucinalis** L.
Double-striped Tabby

*1045 **Hypsopygia costalis** F.
(*fimbrialis* Schiff.)
Gold-fringed Tabby

*1046 **Pyralis pictalis** Curt.
Painted Meal Tabby

1047 **Pyralis manihotalis** Guen.
Indian Tabby

1048 **Pyralis farinalis** L.
Common Meal Tabby

1049 **Pyralis lienigialis** Zell.
Lienig's Tabby

*1050 **Aglossa pinguinalis** L.
Large Stable Tabby

1051 **Aglossa caprealis** Hübn.
Small Stable Tabby

1052 **Aglossa dimidiatus** Haw.
Tea Tabby

1053 **Aglossa ocellalis** Led.
Mottled Tabby

*1054 **Synaphe punctalis** F.
(*angustalis* Schiff.)
Long-legged Tabby

PHYCITINAE

*1055 **Anerastia lotella** Hübn.
Coast Knot-horn

*1056 **Gymnancyla canella** Schiff.
Hoary Knot-horn

*1057 **Pempelia dilutella** Hübn.
Powdered Knot-horn

1058 **Pempelia ornatella** Schiff.
Ornamental Knot-horn

*1059 **Alispa angustella** Hübn.
Narrow-winged Knot-horn

*1060 **Hypochalcia ahenella** Schiff.
Dingy Knot-horn

*1061 **Laodamia fusca** Haw.
Brown Knot-horn

*1062 **Dioryctria splendidella** H.-S.
Splendid Knot-horn

1063 **Dioryctria mutatella** Fuchs
Twelve-thorned Knot-horn

1064 **Dioryctria abietella** Schiff.
Pine Knot-horn

*1065 **Nephopteryx formosa** Haw.
Beautiful Knot-horn

1066 **Nephopteryx palumbella** F.
Mealy Knot-horn

1067 **Nephopteryx adelphella** F.R.
Two-thorned Knot-horn

1068 **Nephopteryx hostilis** Steph.
Pale-shouldered Knot-horn

1069 **Nephopteryx genistella** Dup.
(*davisella* Newm.)
Gorse Knot-horn

1070 **Nephopteryx similella** Zinck.
Oak Knot-horn

1071 **Nephopteryx semirubella** Scop.
(*carnella* L.)
Rosy Knot-horn

*1072 **Salebria obductella** Zell.
Kent Knot-horn

1073 **Salebria betulae** Deg.
Birch Knot-horn

*1074 **Epischnia bankesiella** Rich.
Bankes's Knot-horn

1075 **Epischnia boisduvaliella** Guen.
(*farrella* Curt.)
Silver-edged Knot-horn

*1076 **Phycita roborella** Schiff.
(*spissicella* F.)
Dotted Knot-horn

*1077 **Trachonitis cristella** Hübn.
Moncreaff's Knot-horn

*1078 **Plodia interpunctella** Hübn.
Cloaked Knot-horn

*1079 **Ephestia elutella** Hübn.
(*sericarium* Scott)
Cinereous Knot-horn

*1080 **Cadra woodiella** R. & Thom.
(*semirufa* Staint. *nec* Haw.)
Wood's Knot-horn

1081 **Cadra figulilella** Gregs.
(*ficulella* Barr.)
Cake Knot-horn

1082 **Cadra cautella** Walk.
(*pascuella* Barr.)
Dried-fruit Knot-horn

1083 **Cadra calidella** Guen.
(*ficella* Dougl.)
Fig Knot-horn

*1084 **Anagasta kuehniella** Zell.
Mediterranean Meal Knot-horn

*1085 **Heterographis oblitella** Zell.
Isle of Wight Knot-horn

*1086 **Homoeosoma sinuella** F.
(*gemina* Haw.)
Twin-barred Knot-horn

1087 **Homoeosoma binaevella** Hübn.
Small Ermine Knot-horn

1088 **Homoeosoma cretacella** Rössl.
(*senecionis* Vaugh.)
Chalk Knot-horn

1089 **Homoeosoma nimbella** Dup.
Small Clouded Knot-horn

1090 **Homoeosoma saxicola** Vaugh.
Narrow Clouded Knot-horn

1091 **Homoeosoma pseudonimbella** Bentinck
Comb Knot-horn

1092 **Homoeosoma nebulella** Schiff.
Large Clouded Knot-horn

*1093 **Nyctegretis achatinella** Hübn.
Agate Knot-horn

*1094 **Apomyelois neophanes** Durr.
Daldinia Knot-horn

*1095 **Kyra cirrigerella** Zinck.
Hairy Knot-horn

*1096 **Myelois cribrumella** Hübn.
(*cribrella* Hübn.)
Large Ermine Knot-horn

*1097 **Mussidia nigrivenella** Rag.
Cocoa Knot-horn

*1098 **Euzophera pinguis** Haw.
(*pinguedinella* Doubl.)
Tabby Knot-horn

1099 **Euzophera cinerosella** Zell.
(*artemisiella* Staint.)
Wormwood Knot-horn

1100 **Euzophera terebrella** Zinck.
Dark Knot-horn

*1101 **Ectomyelois ceratoniae** Zell.
Blunt-winged Knot-horn

*1102 **Eurhodope marmorea** Haw.
Marbled Knot-horn

1103 **Eurhodope advenella** Zinck.
Dove-coloured Knot-horn

1104 **Eurhodope suavella** Zinck.
Porphyry Knot-horn

*1105 **Acrobasis consociella** Hübn.
Broad-barred Knot-horn

1106 **Acrobasis sodalella** Zell.
Camarade Knot-horn

1107 **Acrobasis tumidella** Zinck.
(*zelleri* Rag.)
Warted Knot-horn

1108 **Acrobasis tumidana** Schiff.
(*rubrotibiella* F.R.)
Bushy Knot-horn

*1109 **Cryptoblabes bistriga** Haw.
Double-striped Red Knot-horn

1110 **Cryptoblabes gnidiella** Mill.
Mediterranean Fruit Knot-horn

GALLERIINAE

*1111 **Arenipses sabella** Hamps.
Ochreous Date Honey

*1112 **Achroia grisella** F.
(*alvearia* F.)
Common Honey

*1113 **Corcyra cephalonica** Staint.
Raisin Honey

*1114 **Melissoblaptes zelleri** Joan.
(*bipunctana* Zell.)
Double-spotted Honey

*1115 **Lamoria anella** Schiff.
Broad-winged Honey

*1116 **Aphomia sociella** L.
(*colonella* L.)
Green-shaded Honey

1117 **Aphomia gularis** Zell.
Brush-winged Honey

*1118 **Galleria mellonella** L.
(*cereana* L.)
Honeycomb

CRAMBINAE

*1119 **Thisanotia chrysonuchellus** Scop.
Powdered Grass-veneer

*1120 **Crambus pascuellus** L.
Inlaid Grass-veneer

1121 **Crambus leucoschalis** Hamps.
Veldt Grass-veneer

1122 **Crambus silvellus** Hübn.
Wood Grass-veneer

1123 **Crambus uliginosellus** Zell.
Marsh Grass-veneer

1124 **Crambus ericellus** Hübn.
Heath Grass-veneer

1125 **Crambus dumetellus** Hübn.
Hook-streak Grass-veneer

1126 **Crambus pratellus** L.
Dark-inlaid Grass-veneer

1127 **Crambus perlellus** Scop.
Yellow Satin Grass-veneer

1128 **Crambus hortuellus** Hübn.
Gaden Grass-veneer

1129 **Crambus hamellus** Thunb.
Pearl-streak Grass-veneer

*1130 **Chrysocrambus craterellus** Scop.
Scarce Grass-veneer

1131 **Chrysocrambus cassentiniellus** H.-S.
(*rorellus* Dup. *nec* L.)
Chalk-hill Grass-veneer

*1132 **Catoptria lithargyrellus** Hübn.
Silvery Grass-veneer

1133 **Catoptria falsellus** Schiff.
Chequered Grass-veneer

1134 **Catoptria verellus** Zinck.
Noble Grass-veneer

1135 **Catoptria permutatellus** H.-S.
(*myellus* Hübn.)
Pearl-mussel Grass-veneer

1136 **Catoptria pinellus** L.
(*pinetellus* L.)
Pearl Grass-veneer

1137 **Catoptria margaritellus** Hübn.
(*margantellus* Hübn.)
Pearl-band Grass-veneer

1138 **Catoptria furcatellus** Zett.
Northern Grass-veneer

*1139 **Agriphila culmellus** L.
Straw-coloured Grass-veneer

1140 **Agriphila geniculeus** Haw.
Elbow-striped Grass-veneer

1141 **Agriphila latistrius** Haw.
Broad-streak Grass-veneer

1142 **Agriphila inquinatellus** Schiff.
Barred Grass-veneer

1143 **Agriphila tristellus** Schiff.
Common Grass-veneer

1144 **Agriphila selasellus** Hübn.
Pale-streaked Grass-veneer

1145 **Agriphila poliellus** Treits.
Metallic Grass-veneer

*1146 **Pediasia fascelinellus** Hübn.
(*pedriolellus* Staint.)
Banded Grass-veneer

1147 **Pediasia contaminellus** Hübn.
(*cantiellus* Tutt)
Waste Grass-veneer

1148 **Pediasia aridellus** Thunb.
(*salinellus* Tutt)
Saltmarsh Grass-veneer

*1149 **Calamotropha paludellus** Hübn.
Reed-mace Grass-veneer

*1150 **Platytes alpinellus** Hübn.
Alpine Grass-veneer

1151 **Platytes cerusellus** Schiff.
Dwarf Grass-veneer

*1152 **Eromene ocelleus** Haw.
Necklace Grass-veneer

*1153 **Chilo phragmitellus** Hübn.
Wainscot Grass-veneer

*1154 **Chiloides cicatricellus** Hübn.
Stripe Grass-veneer

*1155 **Ancylolomia tentaculellus** Hübn.
Large Dactylis Grass-veneer

PTEROPHORIDAE

AGDISTINAE

*1156 **Agdistis bennetii** Curt.
Sea-side Plume

1157 **Agdistis staticis** Mill.
(*clivicola* Meyr.)
Cliff Plume

PLATYPTILIINAE

*1158 **Stenoptilia pterodactyla** L.
(*fusca* Retz.)
Brown Wood Plume

1159 **Stenoptilia plagiodactyla** Staint.
(*bipunctidactyla* Haw. *nec* Scop.)
Grey Hill Plume

1160 **Stenoptilia bipunctidactyla** Scop.
(*arida* Zell.)
Grey Wood Plume

1161 **Stenoptilia saxifragae** Fletch.
Saxifrage Plume

1162 **Stenoptilia zophodactyla** Dup.
(*loewi* Zell.)
Dowdy Plume

1163 **Stenoptilia pneumonanthes** Buettner
(*graphodactyla* auct.)
Gentian Plume

*1164 **Marasmarcha lunaedactyla** Haw.
(*phaeodactyla* Hübn.)
Livid Crescent Plume

*1165 **Buckleria paludum** Zell.
Marsh Plume

*1166 **Capperia britanniodactyla** Gregs.
(*heterodactyla* Haw.)
Spotted Black Plume

*1167 **Crombrugghia distans** Zell.
Breckland Plume

*1168 **Oxyptilus pilosellae** Zell.
(*didactyla* Steph.)
Spotted Rusty Plume

1169 **Oxyptilus parvidactyla** Haw.
Small Plume

*1170 **Eucnemidophorus rhodo-dactyla** Schiff.
Rose Plume

*1171 **Amblyptilia punctidactyla** Haw.
(*cosmodactyla* Hübn.)
Dark-brindled Plume

1172 **Amblyptilia acanthodactyla** Hübn.
(*calodactyla* Haw. *nec* Hübn.)
Beautiful Plume

*1173 **Platyptilia tesseradactyla** L.
(*fischeri* Zell.)
Irish Plume

1174 **Platyptilia calodactyla** Schiff.
(*zetterstedti* Zell.)
Boyd's Goldenrod Plume

1175 **Platyptilia gonodactyla** Schiff.
(*trigonodactyla* Haw.)
Triangle-marked Plume

1176 **Platyptilia isodactyla** Zell.
(*monodactyla* Haw. *nec* L.)
Hoary Plume

1177 **Platyptilia ochrodactyla** Schiff.
(*dichrodactyla* Mühl.)
Ochreous Plume

1178 **Platyptilia pallidactyla** Haw.
(*bertrami* Rössl.)
Pale Plume

PTEROPHORINAE

*1179 **Pterophorus pentadactylus** L.
(*tridactylus* Scop.)
Large White Plume

1180 **Pterophorus baliodactylus** Zell.
(*tridactylus* Haw.)
Dingy White Plume

1181 **Pterophorus tetradactylus** L.
(*tridactylus* L.)
White-shafted Plume

1182 **Pterophorus icterodactylus** Mann
Burren Plume

1183 **Pterophorus galactodactylus** Schiff.
Spotted White Plume

1184 **Pterophorus spilodactylus** Curt.
(*migadactylus* Haw.)
Horehound Plume

*1185 **Pselnophorus brachydactylus** Koll.
Short-winged Plume

*1186 **Adaina microdactylus** Hübn.
Hemp-agrimony Plume

*1187 **Leioptilus lienigianus** Zell.
Sluggish Plume

*1188 **Oidaematophorus carpho-dactylus** Hübn.
Citron Plume

1189 **Oidaematophorus osteo-dactylus** Zell.
(*microdactylus* Zett.)
Bright Goldenrod Plume

1190 **Oidaematophorus bowesi** Whalley
Bowes's Plume

1191 **Oidaematophorus tephra-dactylus** Hübn.
(*monodactylus* Steph.)
Curtis's Plain Plume

1192 **Oidaematophorus litho-dactylus** Treits.
(*similidactylus* Dale)
Dusky Plume

*1193 **Emmelina monodactylus** L.
(*pterodactylus* Hübn. *nec* L.)
Common Plume

ALUCITIDAE

ALUCITINAE

*1194 **Alucita hexadactyla** L.
(*polydactyla* Hübn.)
Twenty-plume

(*To be continued*)

EUPROCTIS SIMILIS FUESSLY (LEP., LYMANTRIIDAE) IN IRELAND

On 24th August, 1959, in company with two young entomologist friends, I visited the Murrough marshes near Newcastle, Co. Wicklow. While beating for larvae we found, to my great surprise, young larvae of *Euproctis similis*. The larvae, which were feeding on sallow, were hibernated successfully and duly produced moths. I subsequently learned that in the spring of 1960 another young collector found larvae at a spot about half a mile further north and bred the moths.

None of the earlier collectors in Ireland recorded the finding of *E. similis,* nor its conspicuous larva, but a specimen of the moth was taken at light at Dollymount, Co. Dublin, in 1934, and another at Seapoint, Co. Dublin, in 1958. These were thought to be chance vagrants, but it seems now fairly certain that the moth has succeeded in establishing itself in Co. Wicklow, and possibly in Co. Dublin. If this is so it is the second species which has extended its range to Ireland in recent years. The other species known to have done so is *Polychrysia moneta* F. (see *Ent. Gazette,* **8**: 156, 1957).

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PLATES

SPECIES NEW TO SCIENCE

SPECIES NEW TO BRITAIN AND OTHER SPECIES OF SPECIAL NOTE